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Vol. XIX | FEBRUARY 12, 1930 | No. 10

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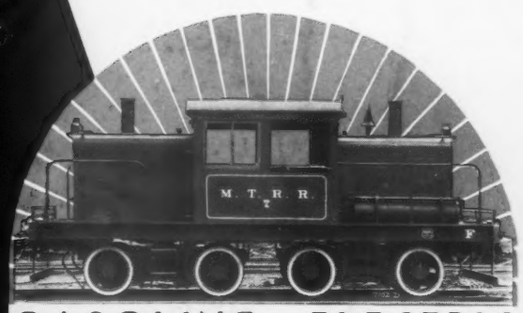

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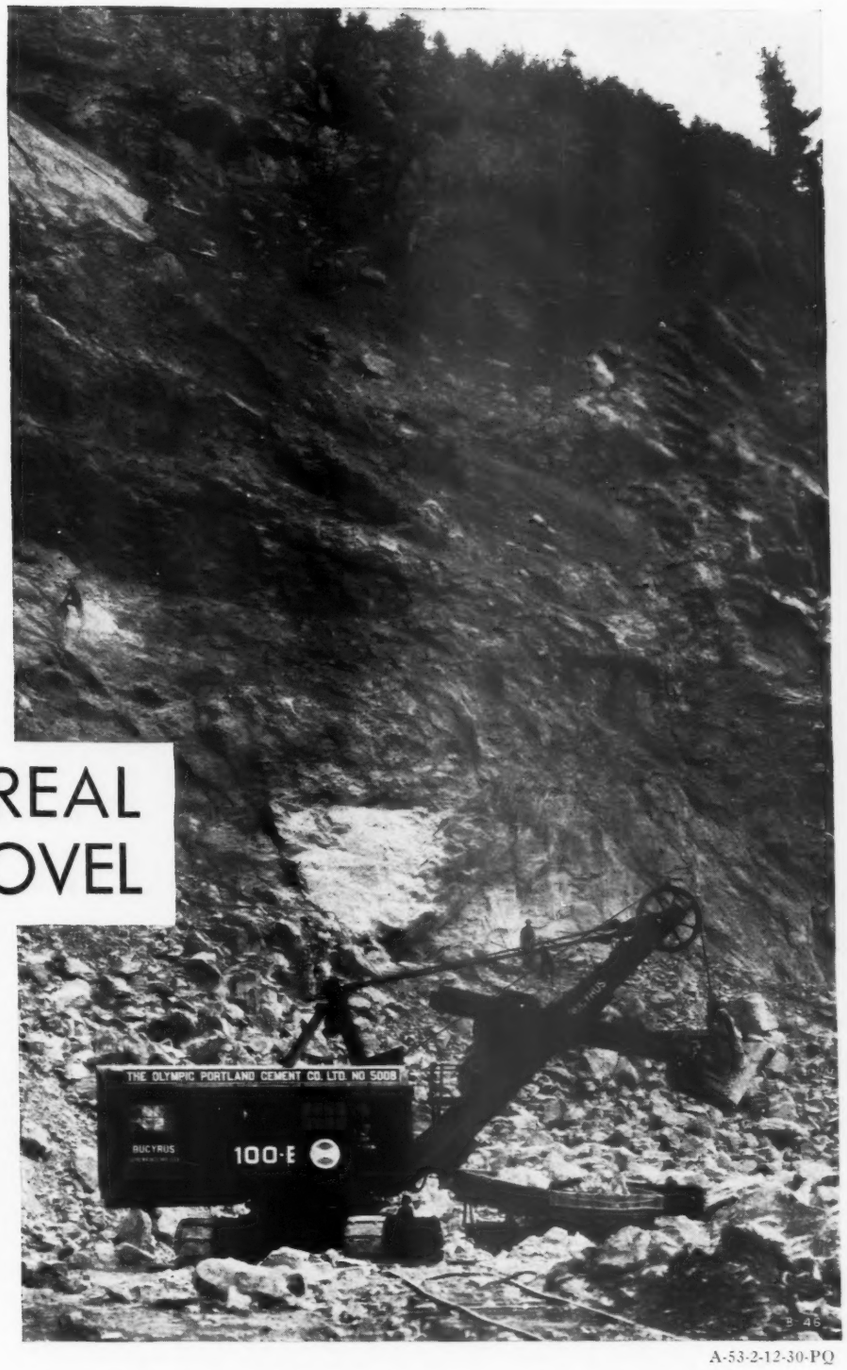

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Vol. XIX CHICAGO, FEBRUARY 12, 1930 No. 10

CONTENTS

National Sand and Gravel Association Holds Annual Convention in Memphis, Tennessee 39

Montezuma Road and Concrete Gravel Company Operates Small Plant in Western Indiana 47

Simplified Practice in the Sand and Gravel Industry 49

Need for Simplification of Sizes in Sand and Gravel Industry 52

Hindrances to Enforcement of Simplified Practice in Sand and Gravel Industry 55

Ready-Mixed Concrete Possibilities for Producers 57

Oakfield Gypsum Products Corporation's New York Plant Features Safety and Economy 63

Men of the Industry.....77
Personal Mention 78
Legal Information for Operators.....82
Traffic News and Comment.....84
Insurance Problems Discussed.....86
Review of Foreign Practice.....87
Latest News Flashes.....88
New Machinery and Supplies.....92

Next Issue February 26, 1930

Pit and Quarry
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CEMENT-MILL & QUARRY

Vol. XIX CHICAGO, FEBRUARY 12, 1930 No. 10

National Sand and Gravel Association Holds Annual Convention in Memphis, Tenn.

Sessions Were Enjoyed Because of Prominent Speakers and Southern Hospitality

THE Fourteenth Annual Convention of the National Sand and Gravel Association began its first session Tuesday, January 28, at the Peabody Hotel, Memphis, Tenn. All of the regular sessions, luncheons, banquet and the party given by the local Memphis producers to association members were held in the ballroom of this hotel.

Tuesday Forenoon Session

In his opening remarks President R. C. Fletcher of the Flint Crushed Gravel Co., Des Moines, Ia., urged the prompt and regular attendance of members at all of the sessions, a sentiment which was repeated, later, by both Executive Secretary Ahearn and Director J. L. Shiely, of the Shiely Co., St. Paul, Minn. The sessions had been arranged purposely of comparatively brief durations and arrangements were made with all exhibitors of equipment to forego their demonstrations during the periods of scheduled sessions. Chairman of the Manufacturers' Division, M. B. Garber (Thew Shovel Co., Lorain, O.) also spoke upon this point at the luncheon and explained the manufacturers' desire to cooperate. This plan proved entirely feasible and there was good attendance at every session.

Welcome by Mayor of Memphis

Mayor Watkins Overton, on behalf of the City of Memphis, then extended the association a most cordial reception. He emphasized the general benefits that can result from conventions of this character in which good fellowship prevails and whose discussions aim to break down questionable business practices and to place the conduct of business on higher planes. He urged the members to take time enough during their visit to see and study this river section of our country so that they might better appreciate the good that would follow adequate measures to control floods and improve river transportation. He predicted substantial prosperity for his city when these things are accomplished.

R. C. Fletcher, retiring president

Mr. Ahern read a telegram from David Alexander of the Dixie Sand and Gravel Corp., Peters-

burg, Va., and introduced W. F. Wise, president of the National Crushed Stone Association.

Public Road Construction

In his address, "Road Construction During the Next Decade," Executive Secretary W. C. Markham of the American Association of State Highway Officials, Washington, D. C., cited many interesting statistics. He estimates that there are, at present, 26,000,000 automobile vehicles in this country, and that there are approximately 182,000 miles of state and 432,000 miles of county improved highways, and yet not more than one-fifth of the necessary mileage has been constructed. Ten years ago Iowa had but 24 miles of paved road whereas now there are five great highways crossing the state east-west.

There is a close relationship between road building and education in rural areas and counties are endeavoring to increase the secondary road mileage.

Mr. Markham analyzed the methods employed in different states for raising funds to construct permanent roads, showing radical discrepancies and inadequacies resulting from license-fee, gasoline-tax, and property-tax practices. Furthermore, it is rather difficult to obtain reliable figures on these items owing to non-uniformity in accounting practices, one significant phase of which pertains to a rational segregation of construction and maintenance expenditures.

V. P. Ahearn, executive secretary

Highways are intended not only for freight transportation but for pleasure driving and visitation, and serious efforts are being made to increase safety of travel on these roads. Last year about one thousand railroad grade crossings were eliminated, but he explained a bitter opposition by some localities over the relocation of highways to effect such eliminations. It is necessary for many concrete roads to be widened to at least four lanes of travel to assure greater safety as well as pleasure.

The growing interest in aviation is demanding many new roads to landing fields. Programs in several parts of the country provide for the beautification of the rights-of-way along public highways, in some instances with parks. [Mr. Markhame failed to remark upon the omnipresent billboard.]

Overhead highways have been proposed for freight traffic over routes of heavy travel. In cities where congestion is acute even triple highways are envisioned.

Construction's Influence in Prosperity

Vice-president T. S. Holden of the F. W. Dodge Corp., New York, spoke at some length upon the economics of industry. By many, economics has been regarded as a "dismal science," but he argued for a change in aspect that would make it an optimistic or hopeful science. He believed that actual construction of all sorts—highways, bridges, dams, irrigation projects, business structures, and residential buildings—is one of the greatest factors in economic progress. This transforms capital—of which our country has plenty—into physical improvements which benefit every citizen in numerous ways.

Mr. Holden paid a compliment to President Hoover for his vision and action in facing squarely a national business necessity, and for what his policy has accomplished. It should not be expected that 1930 will be the greatest ever for there are many economic factors totally aside from the stock-market crisis which have bearing upon business, especially the construction business. However, 1930 will be a typically prosperous year. Mid-winter is a poor time to judge construction progress. Conditions are improving in bonds, and the steel and electrical industries are showing substantial growth. Residential expansion will probably be slight this year, but attention is being given recently to the modernization of obsolete residential and business buildings, as a matter of solving the trying problem of obsolescence. Our financial resources are greater than ever before. Construction and engineering will continue to maintain prosperity in our country.

John Prince, regional director, Kansas City, Mo.

Walter Smith, of the Memphis Stone and Gravel Co., Memphis, was then called upon. He has been ill and he stated that he had purposely postponed thirty days a departure that had been ordered by his physician, in order that he might attend this convention and voice his welcome to his home city.

The room was decorated with a large basket of roses furnished by the National Slag Association.

Tuesday Afternoon

The Tuesday luncheon was attended by about 150 producers and manufacturers. Entertainment was furnished by an eight-piece jazz orchestra, followed by several selections by a vocal quartette of high merit.

After the repast, President Fletcher introduced Chairman J. L. Shiely (who needed no introduction) and the crowd was jovial over his numerous stories. He introduced L. T. McCourt, Central Sand and Gravel Co., Memphis, chairman of the entertainment committee and made a suggestion about calling upon him in case members needed aid before the convention was over—a point not entirely clear to some in attendance. W. B. Garber, chairman of the Manufacturers' Division, also said a few words.

Mr. Fletcher then introduced President W. F. Wise, of the National Crushed Stone Association, who responded by remarking that this was the "best bunch of fellows I ever met in my life," and bespoke closer cooperation between the two national associations which really have problems that are mutual. H. M. Davison, chairman of the Manufacturers' Division of the National Crushed Stone Association and formerly holder of that position with the Sand and Gravel Association, then spoke a few words.

Mr. Shiely then introduced Secretary Ahearn of the Association and Director Hugh Haddow, Jr., of the Menantico Sand and Gravel Co., Millville, N. J. He next introduced Joseph M. Fly of the Memphis Chamber of Commerce, who announced a National Flood Control and Navigation Congress which is being arranged to meet in the city some time during the coming spring. He requested members to give their personal cooperation to this affair and to induce similar support by their respective city, state, and federal officials. Mr. Shiely then introduced representatives of the various manufacturers who had exhibits at the convention.

Tuesday Afternoon

Although nearly all of the exhibits by manufacturers were in readiness in the morning, the

F. W. Peck, director

official opening of the exposition was scheduled for 2:30 Tuesday afternoon. The 52 booths occupied space in the main lobby and around the mezzanine floor of the Peabody Hotel.

H. M. Davison

At 2:45 p.m. the board of directors of the Association held an executive session to prepare reports to the convention later concerning the financial budget and nomination of officers for the ensuing year.

Trade Practice Considerations

The morning session of Wednesday, presided over by Hugh Haddow, Jr., of the Menantico Sand and Gravel Co., Millville, N. J., was opened by an address, "The Trade Practice Conference as an Asset to Business," delivered by Henry P. Fowler, of the U. S. Chamber of Commerce. Mr. Fowler, an attorney who has devoted much time to the subject of ethical trade practices and their value to industry, attended the National Crushed Stone Association convention in Cincinnati, January 20 to 23, and gave much helpful advice to committee members, association members, and the unorganized section of the crushed-stone industry at the association's trade-practice session on January 22 and to the crushed-stone producers who attended the Trade Practice Conference on January 23. He met the sand and gravel producers, therefore, with the crushed-stone experience fresh in his mind and was able to give them the benefit of his discussions with a closely-related industry.

In his address, Mr. Fowler was particular in emphasizing the true nature of the relationship between industry and the Federal Trade Commission, pointing out that the commission's work is preventive and not punitive in character, that it aims to help business put its operations on an economically sound basis, and that it really assists it in arriving at a high degree of self-control. He referred to the remedies that were open, under the common law, to the merchant or manufacturer who considered himself the victim of unfair competition and he drew attention to the fact that the act which created the Federal Trade Commission was framed for the protection of the public rather than the unfairly-treated business man or corporation.

He explained that the trade-practice movement in industry has made great strides since the first conference was held in 1919, that more than a hundred industries have adopted fair trade-practice rules, and that fifty trade-practice conferences in as many different industries were held in 1929 alone.

The trade-practice rules adopted by those industries which have elected to discipline themselves fall into two groups. In Group I are embodied the rules covering all those practices which are held by the Federal Trade Commission to be infractious of the law, while in Group II are placed the rules covering all those practices which, while probably not violations of law per se, are considered, by the industry adopting them, as unsound and unfair business practices which the industry condemns. In no case do the rules adopted aim at price fixing, territorial allotments, or the curtailment of production, as any agreement having such objects would be illegal and unenforceable, having for their result, if not their object, the restraint of free competition.

In the opinion of Mr. Fowler, it is advantageous to an industry to meet and openly to discuss the practices it considers unfair, as such a meeting focuses the attention of the industry upon those methods and customs which are inimical to the healthy development of business along sound lines. The subsequent publication, by the Federal Trade Commission, of rules disapproving such practices, aids still further in raising the ethical standards of the industry. As a third advantage, Mr. Fowler cited the fact that the industry adopting such rules works jointly with the Federal Trade Commission for their enforcement, special machinery being set up by the industry for that purpose.

George A. Rogers, chairman, Committee on Standard Depreciation Scale

The Federal

Trade Commission enforces the rules in Group I against every member of the industry whether or not he has indorsed them individually, not because they have received the approval of the industry at large but because they relate to illegal practices. It does not have authority, however, to enforce the rules in Group II, unless they, too, deal with practices that violate the law.

Following Mr. Fowler's informative talk, Hugh Haddow, Jr., chairman of the National Sand and Gravel Association's Committee on Trade Relations, read a report on the work of his committee, which has given much time to a consideration of the advantages of trade-practice rules to the sand-and-gravel industry. His report discussed in greater detail some of the subjects treated by Mr. Fowler, and concluded with the following recommendations:

"1. A trade-practice conference of the sand-and-gravel industry would be of distinct value to our business.

"2. A resolution should be adopted by the convention requesting the Federal Trade Commission to call a trade-practice conference of the sand-and-gravel industry.

"3. The Trade Relations Committee should be instructed to continue its work and to represent the industry in negotiations with the Federal Trade Commission.

"4. An effort should be made to emphasize the value of educating the industry to a full realization of what a trade-practice conference means, to the end that its fullest possible advantages may be conferred upon the individual producer.

"5. Resolutions covering objectionable trade practices in the sand-and-gravel industry should be prepared at this convention, so worded as to leave no occasion for doubt concerning their meaning."

Having finished the reading of his report, Mr. Haddow asked for a full, frank discussion of the subject. Three other members of his committee spoke briefly in response. John Prince, of the Stewart Sand Co., Kansas City, Mo., said that his committee had examined the rules of other industries and had found from 20 to 25 of their bad practices common to the sand-and-gravel industry and no fewer than six indulged in by his own company. He moved the adoption of the committee's report and of the resolution asking for the formulation of suitable rules.

C. E. Proudley, member Standard Specifications Committee

R. J. Potts, of the Potts-Moore Gravel Co., Waco, Tex., explained that the holding of a trade-practice conference or the adoption of fair-practice rules would not prevent sand and gravel producers doing anything that is now legal, and that the Federal Trade Commission will not recognize the conference's work unless a major part of the industry is represented in the conference. He asked for specific cases of law violations.

Stephen Stepanian, chairman, Committee on Standard Specifications

V. O. Johnston, of the Lincoln Sand and Gravel Co., Lincoln, Ill., expressed himself as convinced that nearly every sand and gravel producer is guilty of some unfair practice. A frank discussion of the industry's unsound methods would alone justify the holding of a trade-practice conference, in the speaker's opinion, and much good should come from an uncovering of the bad practices prevalent in the industry.

Responding to an invitation from the chairman, W. F. Wise, president of the National Crushed Stone Association, reported briefly on the work of his association with the trade-practice conference idea. He recommended the adoption of suitable trade-practice rules by the sand-and-gravel industry, saying that many of the problems discussed and many of the practices condemned are common to both the crushed-stone and the sand-and-gravel industries. He also offered sand and gravel producers the cooperation of his association in working out their trade-practice problems.

Charles Yon, of the Iron City Sand and Gravel Co., Pittsburgh, Pa., said that, in his opinion, all the bad practices enumerated in trade-practice rules were only different forms of price cutting, and that an agreement to maintain prices would automatically eliminate those practices.

To this Mr. Fowler replied by saying that no agreement to maintain prices—a procedure in itself illegal—was needed in order to avoid the bad practices named in various trade-practice rules, and that the mere adoption of rules aimed at the elimination of those practices would have the effect of correcting the price-cutting evil.

V. P. Ahearn, executive secretary of the association, then read a list of bad practices which had been discovered in the sand-and-gravel industry.

Mr. Prince then mentioned a common situation in which a cement manufacturer, who also supplies crushed stone, submits a single bid covering the two products, the lowness of his bid indicating clearly that the stone is being offered at a price below market and, sometimes, below cost. He thought a rule should be prepared covering cases of this kind.

Mr. Fowler said in reply that such a rule had been proposed by the Trade Practice Committee of the National Crushed Stone Association, but that it had been rejected on account of the Federal Trade Commission.

Mr. Prince's motion for the adoption of the report of the Committee on Trade Relations and of the resolution asking for the formulation of a set of suitable trade-practice rules was then put to a vote and unanimously carried.

Evening Entertainment

Ample provision was made throughout the convention for the amusement and entertainment of the guests. After the Tuesday afternoon session an unusual form of entertainment was provided in the assembly hall in the form of turtle races. This attracted considerable attention and each turtle soon had backers to cheer him on. At 7 p. m. there was a producers' dinner, to which all members were invited. This was followed by a dance, music being provided by a good local orchestra. Light refreshments were served throughout the evening.

Wednesday Afternoon

The Wednesday afternoon session was opened at 2:55 p. m. by President Fletcher, who, after a few preliminary remarks, introduced H. V. Owens as presiding officer in place of Alex W. Dann, who did not attend the convention.

The first speaker, R. L. Lockwood, Division of Simplified Practice, U. S. Bureau of Standards, spoke on "Develment of Simplified Practices in American Industry." He reviewed the progress which his department has made in simplifying the operations and reducing the production costs of various industries. He gave specific instances in which simplified practice had produced beneficial results and assured those present that the Division is ready to extend this same help to the sand-and-gravel industry if so requested.

F. D. Coppock, regional director, Greenville, O.

F. H. Jackson, U. S. Bureau of Public Roads, then spoke on the "Need for Simplification of Sizes in the Sand-and-Gravel Industry." He said that the problem of this industry differs from others in which simplified practice has been successfully applied in that its product is a natural one which cannot be controlled as is the case with a manufactured product. He endorsed local simplification to suit the needs of producers having the same type of deposits and a flexible national standard which would cover the entire sand-and-gravel industry, all local specifications to come within the limits of this standard.

Stephen Stepanian, Arrow Sand and Gravel Co., chairman of the committee, then read the Report of Committee on Standard Specifications which was organized early in 1926. This reviewed the committee's activities since its formation and made recommendations for future work. Considerable work was done in co-operation with the Division of Simplified Practice in determining a range of commercial sizes to cover the common uses of sand and gravel. The report also gave the committee's recommendations for sizes to be adopted.

Ray V. Warren, Western Pennsylvania Sand and Gravel Association, then gave a discussion of the two previous papers. He stressed the fact that not only reduction of variety but reduction of variety of quality—uniform good quality—is necessary in simplified practice.

The obstacles to the simplification of gravel sizes, according to Mr. Warren, are: geographic variation of deposits; variation in local specifications; and lack of harmony between city, county, state and private engineers in the same locality. He stated that he personally examined eleven specifications in the Pittsburgh district and found fifty-one sizes specified by the U. S. Government, state, county, city, railway companies, highway and bridge engineers. Twenty-nine of these sizes were coarse aggregate. Six of them were specified for base course for highways near Pittsburgh. He recommended treatment of this problem in zones, these zones to be determined by the type of deposit.

F. M. Welch, chief engineer, American Aggregates Corp., Greenville, O., then reviewed his experience in standardization which goes back more than twelve years. According to Mr. Welch, there is a trend toward the shipment of separate segregated sizes due to the tendency of graded aggregate to segregate in shipment and handling. This is particularly true in the sand-and-gravel industry because round material segregates more easily

than angular material.

F. A. Bingham, Northern Gravel Co., West Bend, Wis., said that little has as yet been accomplished in Wisconsin on standardization and reviewed the work his company had done along this line. Specifications were adopted by the company in co-operation with architects, engineers, contractors and building material dealers. These have since been adopted by some of the other producers in the district. Mr. Bingham suggested that the association supply each engineer and contractor with a list of the sizes specified by the association to reduce the wide variety of sizes called for in his state.

F. M. Welch, American Aggregates Corp., Greenville, O.

Stanton Walker then conducted a discussion of the subject, in which Mr. Warren and T. E. Popplewell of the Fort Worth Sand and Gravel Company took active part. R. J. Potts, Potts-Moore Gravel Co., Waco, Texas, then moved that the recommendations of the specifications committee be accepted, which motion was duly seconded and passed.

The Annual Banquet took place at 7 p. m. Wednesday in the Reception Room of the Peabody Hotel. The hotel orchestra entertained during the repast, which did justice to the reputation of southern cooking. Later the guests were entertained by a mixed choir of eighteen people from a colored Baptist church in Memphis. Dressed in appropriate costumes, they played the part of cotton pickers working on a plantation, singing spiritual and folk songs as they went about their work. This phase of southern life was new to many of those present and, as the choir was very well trained, was highly appreciated. The tables were then cleared away for dancing, most of those present remaining until the orchestra dispersed at midnight.

The Thursday morning session was called to order at 10:30 by John Prince, presiding officer. Stanton Walker gave a brief resume of the history of the ready-mixed concrete industry and the work that the association has done in connection with it.

H. F. Thomson, General Material Co., St. Louis, Mo., spoke on "Some Characteristics of the Ready-Mixed Concrete Business." He covered all phases of the industry from the erection of the plant and the selection of the site to the delivery of the product. Mr. Thomson spoke of the ready-mixed concrete producer as more than that—a manufacturer of a perishable commodity—and said that engineering skill and construction experience are also necessary to operate such a plant successfully.

As was the case last year at Cleveland, this session drew the largest attendance of the convention and created much interest and discussion. Many of those present are operators of central-mixing or transit-mixing plants and a number of others were interested in such operations.

Alexander Foster, Jr., Warner Bros., Philadelphia, then gave some of the advantages of ready-mixed concrete over that mixed on the job by the contractor. In the first place, the concrete is mixed under rigid control and inspection by the most scientific methods. A laboratory at the plant and trained inspectors and engineers make this possible. Secondly, the same force of trained men is always on hand ready and able to mix any specified concrete much more accurately and consistently than the green and cheap labor generally found operating construction mixers.

Mr. Foster stressed the necessity of a uniform quality of product and recommended a sieve analysis of all aggregate used to insure accurate and correct proportioning. He endorsed measurement of aggregate by weight due to the variation in moisture content of fine aggregate which causes great fluctuation in the volume. Concrete should be designed for strength and frequent tests made to insure results. He also recommended that an engineer be employed by every plant to see that the concrete produced is correctly used and placed, as the concrete producer is generally blamed for poor results which are due to carelessness on the part of the contractor. The only way to build up confidence in the product, according to Mr. Foster, is to maintain uniformity and high quality.

J. L. Shiely, regional director, St. Paul, Minn.

J. L. Shiely, J. L. Shiely Co., St. Paul, Minn., then discussed his one year's experience in the ready-mixed concrete business. He told how he was forced into this business for self-protection and

V. O. Johnston, director, Lincoln, Ill.

outlined some of the difficulties encountered, especially at the start. He said that quality, uniformity and accurate control were big factors in gaining the confidence of the contractors, engineers and architects.

He also stressed the desirability brought out by Mr. Foster of employing an engineer to see that the concrete is correctly used and added the necessity of a complete system of recording tests. He cited an instance where a form collapsed, injuring a number of men. The contractor attempted to throw the blame on the concrete producer, but a complete record of tests and inspection proved the actual cause to be poorly braced forms.

He said that he preferred the inundation system of controlling the moisture content of fine aggregate and discussed the ramp and hopper systems of delivering the concrete. He also advised a thorough understanding with the contractors before deliveries are made and said that the strongest selling point was a guarantee of the strength of the concrete delivered. The use of Haydite and other light aggregate was also discussed.

J. E. Burke, Ready-Mixed Concrete Co., Pittsburgh, Pa., whose paper on this subject at last year's convention created so much interest, spoke of the obstacles in the path of concrete producers. He endorsed the strength specification which is favored by architects and engineers, although construction foremen are often opposed to this method. He advised that each job be treated as a separate problem, that the producer be prepared at all times for unusual demands and that at least five cylinders be tested at one time to insure a fair average. He also proposed the organization of a ready-mixed concrete producers' division of the association.

Mr. Prince then said that the association would seriously consider the establishment of such a division. Mr. Shiely moved that action be taken in this matter, and W. A. Bliss, Keystone Sand and Supply Co., Pittsburgh, seconded the motion.

Daniel Hubbard, division engineer, Chesapeake and Ohio Railway, then spoke on "Gravel Ballast for Railroad Purposes." He first discussed the proposed reduction of the three types of gravel ballast now in use—washed gravel, screened gravel, and pit-run gravel—to two—prepared gravel and pit-run gravel. He then discussed the superiority of prepared gravel for ballast purposes and advised producers to strictly adhere to A. R. E. A. specifications for this product. He also discussed the growing use of sand, a waste product with many producers, for ballast purposes under certain conditions.

C. N. Conner, engineering executive, American Road Builders' Association, then presented a paper entitled "Use of Sand and Gravel in Low-Cost Road Construction." He gave a very interesting and authentic review of the use of gravel in the United States for road work, with statistics to back up his statements. He also defined the need for low-cost roads of a type which would be adequate until funds were available for a higher type of road, and outlined the advantages of gravel for this purpose.

Delegates' Luncheon

There was a large attendance at the luncheon on Thursday. High-class entertainment was provided by a 15-piece orchestra of Pullman Porters, by vocal and dance soloists, and especially by a colored country preacher who expounded upon "Sand, Gravel, Grits, and Greenbacks," with a number of subtle allusions to personal foibles of certain sand and gravel men, who accepted the jokes good-naturedly.

Thursday Afternoon Session

When the session reconvened after the luncheon, Director Stanton Walker, of the Engineering and Research division of the association, read excerpts from his prepared address that had been scheduled for the forenoon session, viz., "Effect of Characteristics of Aggregates on the Quality

(*Continued on page* 69)

Montezuma Road and Concrete Gravel Company Operates Small Plant in Western Indiana

BY THOMAS L. COLLINS

ALTHOUGH a newcomer in the business of producing sand and gravel in the Montezuma, Ind., territory, the Montezuma Road and Concrete Gravel Company, owned by C. Elmer Garrard, gives promise of developing into one of the modern sand and gravel producing plants in this vicinity.

This plant, which operates in a tract of 45 acres, was opened in the fall of 1928 and came into production the following spring. A Bucyrus 20 B steam shovel is used, with a ¾-cu. yd. clamshell bucket, and ⅝-in. Leschen ropes. This shovel dumps the material into a wooden bin which feeds into a 4-ft. by 6-ft. vibrating screen with 2-in. mesh made by the Deister Machine Company. A 1½-in. mesh screen is on hand and can be installed when desired. This screen, which has a capacity of 150 tons an hour, is operated by a 2-hp. Century electric motor. It has given excellent service, according to Mr. Garrard, and provides sufficient capacity for all the material they can handle.

From the screen the material is loaded into cars or truck by a Burch conveyor, 32 ft. long, with a 24-in. belt, operated by a 10-hp. Century motor.

For removing the overburden, which runs from 5 ft. to 8 ft. thick, an Orton-Steinbrenner Model No. 7-ton dragline with ¾-cu. yd. bucket and ¾-in. Leschen rope is used. On the railroad siding which runs alongside this plant, a 5-ton Caterpillar gasoline tractor is used to move the cars.

Steam shovel and dragline

Although not in operation at the time this article was written, a 9-in. by 14-in. jaw crusher, made by the Good Roads Machinery Company, and operated by a 25-hp. General Electric motor, has been installed. It will be used to reduce the oversize

General view of the sand-and-gravel pit

stone which will be fed direct to the crusher from the screen. A conveyor belt will carry the crushed material back to the hopper.

The proportion of sand and gravel produced at this plant varies to a certain extent, the present run being about 60 per cent gravel, although the material is coarser toward the bottom of the deposit. An excellent grade of road gravel is produced, and the output of this plant is sold largely for this purpose. Some concrete gravel is produced for railroad work.

The production schedule of this plant calls for two shifts, and for the night work a complete system of electric lights has been installed.

Much Construction Pledged

In addition to the needed construction, the growing availability of funds with which to finance it and the existence of sound business conditions on which construction activity can be based, there likewise are pledges already made covering a large volume of construction. Projects amounting in value to nearly $4,500,000,000 have been pledged as a result of the recent conference called by President Hoover, according to a report published in the Chicago *Journal of Commerce*. While these include some things besides construction proper, the total estimated value of the work cited is much over half of the total estimated value of all construction in 1929. In addition, the projects include little in the residential, business and commercial building classifications, the estimated value of which in 1929 was considerably over three billion dollars. In short, the construction work pledged, plus the other types of building that may reasonably be expected to go ahead, should make 1930 equal or exceed this year's volume if it does not approximate the record-breaking year of 1928.

This view that 1930 will show progress in the construction field is predicated on three things: (1) That the example set by the business and industrial leaders who have made pledges will be followed by the rank and file. The thousands of smaller companies throughout the country whose aggregate constrution volume mounts into millions must join in pushing ahead necessary improvements to supplement the bigger projects that have been pledged if the desired totals are to be reached; (2) That the defeatist psychology, which is easy for individuals who may have suffered in the stock debacle to adopt and spread, will be replaced by a spirit of confidence. There are indications that this change to a more hopeful and constructive point of view is rapidly taking place; (3) That people realize that following such a gigantic financial crash, normal conditions cannot be achieved immediately but that a few months are required to work out readjustments. But if everyone will appreciate the value of hard work and will give his utmost to the job, there is every reason to believe that 1930 will yield a satisfactory volume of construction.

While general construction prospects for 1930 appear encouraging, conditions in the cement industry leave much to be desired. Certain fundamental readjustments are required if the industry is to receive a reasonable return on its operations. One undesirable condition that needs rectification is the excess producing capacity of plants in relation to the demand for the product. Figures of the U. S. Bureau of Mines show that, instead of improving, this situation is becoming more serious. For the 12 months ending November 1, 1929, the relation of shipments to capacity was 67 per cent.

Need Tariff Protection

Another adjustment that is needed is tariff protection for companies operating in seaboard markets. At present they must meet the competition of foreign cement makers who have the advantage of lower wage scales, cheaper transportation and no duty to pay. Foreign cement manufacturers pay their labor only about one-fourth of that paid by American manufacturers. It costs less to ship cement from a Belgian mill, for example, to Charleston, more than 3,500 miles, than it costs to ship American cement to the same port from Birmingham, the leading American source of supply for that port. There is no tariff to equalize these differences. Because of this competition, 80 per cent of all American cement sold in these seaboard markets in 1928 was sold at a loss. Several American plants have been shut down and others have curtailed their output because of this foreign competition. This unsatisfactory condition and the others mentioned must be remedied if the cement business is to prosper with the rest of the construction industry in 1930.

New Cement Plant in New South Wales

The first unit of Southern Portland Cement Ltd., Berrima, New South Wales (Australia), was put into operation a short time ago, with a capacity of 750,000 tons of cement a year, and a second unit of similar capacity is to go into operation soon. The new plant is valued, according to *Chemical Engineering and Mining Review* (Melbourne), at £1,000,000. The controlling interest is held by Australian Iron & Steel Ltd. and Howard Smith Ltd.

Associated with the works at Berrima are the company's coal mine, which is being equipped for an output of 1,000 tons a day, and its limestone quarries at Marulan, from which the raw material will be transported 30 miles for treatment. A dam in the Berrima River, holding about 200,000,000 gal. of water, a pumping station, and a power plant generating 2,200 k.w. are included in the equipment. About 300 men will be employed.

Simplified Practice in the Sand and Gravel Industry

By R. L. LOCKWOOD,
Division of Simplified Practice, Department of Commerce

SIMPLIFIED practice is a relatively new term for an idea which is as old as industry itself. Fundamentally, it means reduction in variety of sizes, style, dimensions, quality, or composition of everyday articles turned out by mass production methods. This in turn means concentration on those sizes or styles which are in greatest demand, or which for some other reason are of most importance. While it may not necessarily mean elimination of all other varieties from production, it usually results in the establishment of a definite list of standard or "stock" sizes, accepted by manufacturers, distributors and users of the commodity, and all other sizes are thereafter regarded as specials. Simplified practice is primarily a business proposition, its sole purpose being to save money in the production and distribution of goods, and to give the consumer better prices, better service, or both.

Simplified practice, or simplification, as it is sometimes called, is often confused with standardization, and in fact it may be said to come under the general head of standardization. In order to clearly define the actual scope and purpose of simplification, it is necessary to make a distinction between this class of work and purely technical standardization. Assuming that the word "standardization" applies to technical standardization only, and the word "simplification" to all commercial standards, the distinction may easily be made. Technical standardization is creative, its function being to set up proper standards of design, construction, workmanship, or performance. Commercial standardization, or simplification, is selective, its function being to determine which existing standards are of greatest importance in a given industry, and to concentrate production upon them so far as is possible.

Certain conditions in the railroad field furnish striking examples of the difference between the two. We have a standard track gauge, universally used by all the standard railroads in the country. From the standpoint of simplification, the exact distance between rails was immaterial; the important point was uniformity, which made interline shipment and car exchanges possible. The railroads agreed to use the track gauge which at that time was most widely used throughout the country. Technical standardization, on the other hand, would have meant determining what the distance between rails should be, which is a job for engineers to work out. Each railroad in the early days worked out this problem to suit its own apparent needs. Simplification then consisted in selecting from among many existing "standard" gauges the one which was most important, and concentrating on that. Similarly, the establishment of standard heights of couplers above the rail head, and of standard inter-locking devices, was first carried out by each individual railroad. Later, when inter-line business developed, a great simplification job was put through, resulting in the present uniformity of height and general design, thereby making all standard rolling stock interchangeable in use.

R. L. Lockwood, U. S. Department of Commerce

The idea of simplified practice is as old as industry itself. For hundreds and thousands of years it was applied only to war materials. Prior to the present industrial age, these were the only materials turned out in what we should now call mass production. With the introduction of power into industry, the same principles were applied to the production of peace-time goods. Every manufac-

*Address, Fourteenth Annual Convention, National Sand and Gravel Association, Memphis, Jan. 29, 1930.

turer recognized clearly the fact that it costs less to make things alike than to make them different; it costs less to make a few sizes in large quantities than to make a large number of sizes in small quantities, even though the total of all production may be the same. Production cost is not the only feature of a manufacturing business. The product must be sold, and, in order to sell it against competition, it may be necessary to develop more variety than consideration of production cost would seem to warrant.

Leaving finance out of the present discussion, there are three major factors in any manufacturing business—design, production, and sales. The production factor invariably pulls in one direction —toward reduction in variety of product. The other two factors pull in the opposite direction. A salesman must sell goods in order to hold his job, and, in order to make sales, he must either give the customer what he wants or persuade the customer to take what he has to sell. Practically all sales are a compromise between these two extremes. But the salesman's job depends upon the quantity of sales, and he naturally wishes to please his customers. Consequently, the sales departments of a vast majority of businesses are constantly bringing pressure toward increasing variety of product, in order to meet some real or supposed need of customers. On the question of design, the factor of individual pride of creation comes into the picture. Designers in all fields, whether engineering or otherwise, wish to impress their individuality upon the product. They wish to improve it, but in too many cases the result is that they design something different though not necessarily better. This factor also pulls toward variety. It cannot be wholly stifled, for without it we would have no new development or invention. It must be kept within reasonable bounds to make sure that new designs are actually better and not simply different.

Three Factors Involved

These three factors of design, production and sales must be kept in balance if a business is to succeed. It is not enough to keep them in "static" balance; they must be kept in "dynamic" or running balance. In this respect a business may be compared to a cone standing on its point. It cannot balance if it stands still, but it will balance if it is in motion, provided its elements are themselves in balance. Furthermore, this balance of elements or factors never remains fixed. Business conditions change, new development comes and the three factors must be constantly watched in order to maintain them in proper running balance, otherwise the structure will sooner or later topple over.

The most successful individual firms have always, consciously or otherwise, been able to keep these elements in balance. During all the early years of our industrial era—in fact, for nearly a century after the introduction of power in industry—business was highly individualistic. Patents, secret processes, closely guarded knowledge of methods and processes, were the rule rather than the exception. Co-operation between competitors was practically unknown until within the last thirty years, although the early trade associations are now more than fifty years old. Individual firms practiced simplification whenever possible, even though they did not call it by that name. Until the World War there was scarcely any co-operative work or simplification between competing firms in the same industry. The War Industries Board exercised its vast powers toward concentrating production on basic necessities and on as few different kinds and sizes as possible. Under war pressure, our industries co-operated for the first time on a nation-wide scale. In spite of the inevitable waste of war-time production, our industries hung up new records almost weekly. Some of our organized industrial leaders began to realize the possibilities of reducing variety of products in a whole industry, and after the war they sought means for carrying on the same principles and practices which had been necessary during the war.

A number of them felt that with the removal of war-time restrictions, variety was increasing too rapidly in many industries. President Hoover was at that time president of the Federated Engineering Societies, and at the request of many industries he headed a committee to make a survey of waste in industry. The committee published a report in 1921, covering six major industries. Figures furnished by experts in those industries had been tabulated and compared with the total business done. These figures showed wastes averaging almost 49 per cent in the industries surveyed. Mr. Hoover had in the meantime become secretary of commerce. Seeing clearly the need for some centralizing agency to co-ordinate the scattered efforts toward waste elimination, he organized the Division of Simplified Practice in the Department of Commerce.

Function of Simplified Practice

This division was set up simply as a clearing house and disinterested co-ordinating body, to co-operate with all groups in industry in an effort to eliminate waste. The survey on waste in industry indicated clearly that excessive variety was one of the most prolific causes of waste. Consequently, the effort of the Division of Simplified Practice has been largely directed toward reduction of variety of products. The division has no police or regulatory powers whatever, nor does it initiate or even suggest definite things to be done. Its function is to assist industry to find and promote the best

thought and practice in connection with given commodities, and to secure the co-operation of manufacturers, distributors and users and all others concerned with a particular commodity. The division also co-operates with technical standardizing bodies, professional societies, chambers of commerce, trade associations, and any other groups which are directly or indirectly concerned in waste elimination. During more than seven years of active work, fairly definite procedure has evolved by which simplified practice projects can be handled to best advantage. This procedure has been developed wholly through actual practice, modified from time to time as needed, and has produced successful results in hundreds of industries. In practically every project, the first move is made by the manufacturers of the commodity in question. If they feel that reduction in the existing variety of sizes or styles of product would benefit them, and request the co-operative services of this division to this end, they are first asked to make a careful survey of production during a period of at least one year, and covering as nearly 100 per cent of the industry as possible. Such surveys show figures in units of product, not in dollars, for the entire industry, and can then be tabulated to show the percentage of each size or variety sold during a given period. In practically every industry thus surveyed, the final tabulation has surprised even those best informed, by disclosing that at least 80 per cent of the business was being done in 20 per cent of the varieties, and vice versa. In some cases the figures have been as high as 95 per cent and 5 per cent.

Elimination of Stock Items

When such a survey has been completed and tabulated, the manufacturers get together and decide for themselves which sizes they wish to retain as standard or stock items. When this "simplified list" has been approved by at least 80 per cent of manufacturers, measured by volume of production, the Division of Simplified Practice calls a general conference to which it invites representative distributors, users, engineers and others interested in the product. The proposals of the manufacturers are presented for open discussion, and if the ground-work has been properly done and the project is sound, it will invariably be adopted at such a general conference. Immediately afterward, the division prepares a detailed report of the conference and sends it to a complete list of manufacturers, distributors, users, and others interested, with a request for acceptance of the simplified list. This acceptance is not a contract of any sort; it is simply a written indication of the signer's approval of the project, and of his willingness to accept the simplified list as his standard of practice. When acceptances have been received from at least 80 per cent of the industry by volume, the simplified list is published by the Department of Commerce, as a "Simplified Practice Recommendation" in the Elimination of Waste Series of the Department, and sent broadcast to all those interested.

At the general conference, an effective date is set at which the recommendation shall take effect for new production. In the case of some commodities, a second and later date is also set, to give dealers time for clearing stocks. The conference also appoints a Standing Committee of representative men, including manufacturers, distributors and users, to sponsor the recommendation after its effective date. One year from that date, the Standing Committee meets to review the adherence to the recommendation. If, owing to changed conditions or new development, it is necessary to modify or revise the recommendation, the Standing Committee recommends such a change, and the revised recommendation is sent out again for acceptance. If no changes are called for, the recommendation is simply reaffirmed for one year, subject to annual review. This procedure assures legality of action, a true consensus of opinion, and the very essential flexibility which any set of standards must have. About 120 Simplified Practice Recommendations have been put through under the auspices of the division, and acceptances have been received from about 1,200 trade associations and other groups, and about 13,000 individual firms.

Co-operation Is Essential

Simplified practice can be applied in any individual business, but its maximum benefits can only be secured by a co-operative program, including a high percentage of all the firms which turn out a given product. For example, 20 firms may be making a similar product, each in 10 different sizes, but if the sizes made by each firm did not agree with any of the others, the industry as a whole is turning out 200 sizes, and the situation of the distributor and user is just as bad as though each firm turned out 200 sizes. Distributors are invariably enthusiastic supporters of a simplification program. They benefit directly through reduced inventories, lower accounting and clerical costs, reduced storage space, and in many other ways. Users benefit through the establishment of stock sizes, easily and quickly available, and in many cases where industries are highly competitive, savings made by manufacturers and distributors are directly reflected in consumer prices. A considerable number of projects in the building and construction fields have been put through with conspicuous success. Difficulties have frequently been encountered in dealing with engineers and others who write specifications for construction materials, but if a project has been carefully and soundly

(*Continued on page* 56)

Need for Simplification of Sizes in Sand and Gravel Industry*

By F. H. JACKSON, U. S. Bureau of Public Roads

TO THE mind of the writer the distinction between "standardization" and "simplification" made by Mr. Lockwood, of the Department of Commerce, in his paper on "Simplified Practice in Industry" before this convention, furnishes a clue to the solution of that long standing and ever vexing problem of too many aggregate sizes. For many years we have been talking in a more or less general way about "standardization" of specifications for aggregate sizes and have even gone so far as to propose a series of so-called standard sizes which were adopted as tentative a number of years ago by the American Society for Testing Materials. The writer is becoming more and more convinced, as time goes on, that our efforts in this direction have been largely misdirected, due to the fact that we have been endeavoring to establish definite specifications for a single series of standard sizes for materials which, as they occur in nature, differ widely in size and in grading. There would appear also to be no real engineering reason why absolute standardization should be effected throughout the United States. The producer of gravel in the Detroit region is not interested in specifications drawn by the cities of Boston or San Francisco. He is vitally interested not only in the specifications which may be drawn by the city of Detroit, but also in those which may be prepared by all other users of gravel in the territory which he serves.

As the writer sees it, the outstanding need in the way of simplification of sizes of aggregates is the reduction of the number of different sizes demanded of the producer in each of the major centers of production and distribution. The producer of sand and gravel, while a manufacturer in a certain sense, is not a manufacturer in the same sense as the producer of, say, paving brick. In the production of paving brick the size to be manufactured is directly under the control of the manufacturer and is influenced by considerations entirely apart from the character of the raw material. So it is with most manufactured products. With sand and gravel, however, the producer is faced with the necessity of utilizing to the best advantage the material which nature has furnished and the sizes and gradings of the finished products which he can economically supply are influenced in a marked degree by the size and grading of the pit run material. He can not supply material with a 2-inch maximum size when the largest size gravel in his pit is 1-inch. Neither can he supply economically an aggregate complying with a specification which calls for a preponderance of the larger sizes when to do so would mean the wasting of large quantities of the smaller sizes. Specifications for sand and gravel in any given region are of necessity dependent upon the character of the materials available in that region.

Too many specifications are written in rule of thumb fashion, without regard to the most economical use of the available material. Engineers are slow to recognize that the exact limiting sizes or exact range in sizes for a given product are not nearly so important as is the question of uniformity of successive shipments of the particular size and grading specified. This is particularly true where the aggregate is to be used in designed mixes of portland cement concrete as opposed to the method of designating arbitrary proportions. The engineer should be able to design a mixture of the required quality regardless of the exact grading of the aggregates furnished. He should, however, have assurance that the *same* size and grading from which he established his design can and will be furnished daily on the job from start to finish. The same is true of other uses of sand and gravel. Uniformity is far more important than mere adherence to some arbitrary size limit and simplification by reduction of the number of sizes required within a given territory will unquestionably facilitate compliance with requirements for uniformity. In this respect simplification is a distinct advantage to the consumer because the producer, having to manufacture and stock only a few distinct grades instead of many grades differing only slightly in size, is in a much better position to make uniform and mutually satisfactory deliveries on any given project. Our experience has been that the aggregate producer is willing and anxious to comply with the specifications and it is obvious that his task will be greatly simplified if he has only one instead of a dozen specifications to meet for a given use.

On the other hand, we must bear in mind that the engineer who uses the material is the man who is going to be held responsible for the quality of construction rather than the producer, and he must be convinced that the size which he will be required to use under a simplification program will be just as satisfactory as the sizes which he has been using. Simplification should be a matter of joint effort between producer and consumer.

*Presented at the Annual Meeting of the National Sand and Gravel Association, Memphis, Tennessee, January 29, 1930.

emphasizing the writer's opinion that national standardization of specifications for sand and gravel is neither necessary nor desirable. However, this does not mean that simplification by reduction of the unnecessarily large number of sizes now specified in the various production regions should not be undertaken. Nor does it mean that a series of nominal size limits covering the major uses of sand and gravel, such as has been recommended by the Committee on Standards of your Association, should not be adopted. These, being merely nominal maximum and minimum size limits, would in no sense be considered as specifications but would be subject to further definition by the insertion of suitable intermediate size requirements and tolerances to meet local conditions. The use of each of the suggested size limits as a frame upon which to hang the simplied specification requirements which may be best suited for that size in each production district as the first step in the simplification program. The adoption of actual specification limits would of course be a matter of joint action by producer and consumer in each case, and this would have to be accomplished before any real benefits from simplification would accrue to either producer or consumer. In a paper presented by L. E. Williams before the 1929 meeting of the American Concrete Institute, efforts being made along this line by a Detroit Regional Conference are described and illustrate the type of joint effort which should accomplish results. It is understood that similar efforts are being made in the Pittsburgh and other districts.

The writer would like the privilege of commenting upon the recommendation made by your Standards Committee relative to the limiting sizes for standard grades of sand and gravel. It is understood that two grades of sand and five grades of gravel have been recommended, as shown.

Recommendations for Commercial Sizes of Sand and Gravel

	¾ in. to 1 in.
No. 4 to ½ in.	1 in. to 1½ in.
½ in. to ¾ in.	1½ in. to 2 in.

It will be noted that the various size limits have been given in terms of both square mesh sieves and round hole screens. Unfortunately, reference to both types is necessary, due to the inability of engineers to agree on a single standard method of measuring size of coarse aggregates.

It appears to the writer that the ⅜-in. maximum size for concrete sand is somewhat high and that it is also out of line with the minimum size of gravel which is given in all cases as No. 4. The ⅜-in. square mesh sieve has a round hole equivalent of about 7/16 in. or almost ½ in., which is larger than the usual limit for concrete sand. The other comment is in regard to the method of designating all material from No. 4 to the maximum size, say 2 in., as a single size. It is recognized, of course, that in many plants the gravel is not screened into several primary sizes, while in others, notably in many of the larger plants, this practice is followed. The writer would like to see the other method of size designation used—that is, each primary separation being considered as a primary size and combinations of them as combination sizes. In other words, the primary gravel sizes would then be

Commercial Sizes		Typical Uses
Square Sieves	Round Screens	
	Sand	
0—No. 8	.....	Sheet Asphalt Bituminous Concrete, Plaster, Mortar, Grout.
0—⅜ in.	0— 7/16 in.	Concrete
	Gravel	
No. 4— ½ in.	¼— ⅜ in.	Thin Concrete Sections, Concrete Building Units, Bituminous Surface Treatment, etc.
No. 4— ¾ in.	¼— ⅞ in.	Light Reinforced Concrete Construction, Maintenance Gravel Roads, etc.
No. 4—1 in.	¼—1¼ in.	General Use as Concrete Aggregate.
No. 4—1½ in.	¼—3 in.	Concrete Highway Construction and General Concrete Work.
No. 4—2 in.	¼—2½ in.	Concrete Highway Construction and Heavy Reinforced Concrete Work.

This would mean, of course, that every gravel producer would have to screen his product into these five separate sizes. A specification could still read, for instance, No. 4 to 1½ in., with suitable intermediate requirements and tolerances. Such a specification would simply mean that the specified material includes four of the primary sizes. Whether it is made up of the four sizes previously screened and then blended to conform to the specification, or whether only two sizes have been originally made, say No. 4 to 3¼ in. and ¾ in. to 1½ in., is a matter of local control. It might even be produced without any separations whatever between the upper and lower limits, provided it were possible to do so and still meet the specifications.

Designating the primary separations in the manner indicated above, however, has one obvious advantage. It makes possible, under favorable circumstances, the shipping of gravel to the job in two or more separate sizes. In such a case, the engineer specifies the number of tons of each size desired separately and the producer ships accordingly. The writer believes that the time is not far distant when engineers in charge of important projects will realize the advantages in the way of increased uniformity to be gained by batching the coarse aggregate in more than one size. It is practically a physical impossibility to handle a shipment of coarse aggregate in which the sizes range from No. 4 to, say 1½-in. square mesh, without segregation, and segregation means non-uniformity of product. It is confidently believed that eventually we shall discard the present unscientific and

haphazard method of handling coarse aggregate in favor of a method which will insure that every batch of concrete will be like every other batch. In the writer's opinion, nothing will contribute more to this end than the adoption of this practice of handling aggregates.

Let us look into the matter a little from the producer's standpoint. What change in present manufacturing and distributing practice would be involved? In the first place, how many important gravel plants handle material running up to, say, 2 in. in size which do not make at least one intermediate separation at either ¾ in. or 1 in.? As a matter of fact, is it not probable that, in the large producing centers, the demand for most if not all of the sizes listed by the committee is sufficient to require the installation of screens for each maximum size specified? However, in many plants, instead of separating the product into a number of primary sizes and then recombining them, gravel of any desired maximum size is obtained by simply screening out the oversize, which is either crushed or wasted as local conditions dictate. Most of the large gravel plants have more or less complicated combinations of screens, bins and chutes arranged and added to from time to time in an effort to manufacture graded products to meet definite specification requirements. In some plants, these installations become so complicated as to be practically a Chinese puzzle to anyone but the plant superintendent. The unfortunate part of it is that, even though these arrangements may be so designed as to blend sizes perfectly in the bin or in the car, segregation in handling will frequently undo the work. Why can not we adopt the rational and simple method of screening the product into the number of primary sizes dictated by the character of the material and the demand and avoid all this trouble? It is of course recognized that, in order to do this, a radical change in construction practice will be required and it will consequently be just as necessary to sell the idea to the engineer as to the producer. Here again we have the possibility of co-operative effort on the part of producer and consumer in putting across a new construction practice which in the writer's opinion would make possible the production of much more uniform concrete at very little additional cost.

The matter of separated sizes, however, though related in a general way to the subject under discussion, is not the question of primary interest. Much missionary work will have to be done before there is general acceptance of that idea. The question of immediate concern is how to secure a reduction in the number of sizes of sand and gravel which commercial producers are now required to produce and stock. As has been noted, the matter of securing acceptance of the recommended nominal standard sizes by the industry and the user would appear to be the first step. The Division of Simplified Practice of the Department of Commerce is admirably equipped to cooperate with the industry in carrying forward this part of the program. However, the mere acceptance of these limiting sizes will not secure relief to the producer who is harassed with a number of specifications differing as to intermediate size requirements even though the upper and lower limits may be the same. The specifications of the various users for any aggregate for a given purpose must be *the same* in any given production region before the problem is really solved. Regional committees made up of representatives of both the producers and the consumers should be formed for this purpose. In this work the producer should take the initiative. He is as a rule better organized than the consumer. His interests in the matter are also more obvious though perhaps not more real than those of the consumer. The regions or areas into which this phase of the simplification program would be divided would correspond obviously to the centers of greatest commercial activity, that is, the regions within shipping radius of the large centers of population. We have already noted activity of this sort under way in at least two such areas—Detroit and Pittsburgh. Why can it not be extended to other areas where similar problems have arisen? The National Association, through its representative members in these regions, is the logical organization to initiate the program.

The Bureau of Public Roads is thoroughly in sympathy with the simplification of sizes and varieties of the various manufactured products used in the construction of roads. The recommendations of the Division of Simplified Practice in the matter of grades of asphalt and varieties and sizes of paving brick have been widely followed by both the industries involved and the user and there is every reason to believe that similar success will attend the efforts which you are about to initiate in the matter of simplification of sizes of sand and gravel.

Honorary Commission Named to Road Congress

President Hoover has appointed an honorary commission to attend the Sixth Congress of the Permanent International Association of Road Congresses to be held in Washington, D. C., Oct. 6-13, consisting of the members of the Cabinet and the chairmen of the Senate and House committees on foreign relations, and on post offices and post roads. President Hoover is honorary chairman of the congress, and Roy D. Chapin is the president of the American organization commission.

Hindrances to Enforcement of Simplified Practice in Sand and Gravel Industry*

By R. V. WARREN, Western Pennsylvania Sand and Gravel Association

THE authors are to be commended for their excellent articles, "Simplified Practice in Industry" and "Need for Simplification of Sizes in Sand and Gravel Industry." These articles are exceptionally interesting, for they bring to the forefront a matter which, the writer believes, has been beckoning your attention for some time. In the writer's judgment these subjects are as important as any which will be discussed at this convention, and the authors have shown that they are fully conversant with the principal factors with which the sand and gravel industry must cope in bringing about simplification of sizes.

Mr. Lockwood informs us that simplified practice is an old idea parading under a new name. He brings out very clearly the meaning of the term simplified practice, what an industry may expect to accomplish by its adoption, and the results thus far obtained by the industries that have put it into force. He also outlines the procedure that is generally followed in bringing about simplification, and offers to the sand and gravel industry the cooperation of the Division of Simplified Practice.

At first Mr. Lockwood's definition of the meaning of simplified practice had little appeal to the writer. Three words, "reduction in quality," seemed to blend themselves together, and these words do not represent what the sand and gravel industry needs. If simplified practice means among other things reduction in quality, then the industry would be better off without adopting the idea. On review, however, another word—variety—interjects itself. With this word included, the definition and purposes become more appealing. As the writer now understands the term, it means, besides "reduction in sizes, style, and dimensions," reduction in variety of quality.

Emphasis should be placed upon this phrase: "reduction in variety of quality." As it applies to the sand and gravel industry, it means that the practice of furnishing good quality of sand and gravel on some occasions and poor quality on others must cease with the adoption of simplified practice. Good quality and poor quality materials mean two different varieties of quality. Clean materials and dirty materials are also two different varieties of quality. Reduction in variety of quality in the sand and gravel industry chiefly means discontinuance of the practice of furnishing clean materials one day and dirty materials the next—it means clean sand and gravel every day.

Mr. Jackson has stated: "Efforts to standardize on a single series of standard sizes nationally are misdirected," and "National standardization of sizes is neither necessary or desirable." He also touches upon the matter of quality by stating, "Uniformity of product is more important than adherence to some arbitrary size." In addition, he suggests a way of classifying sizes by making each primary separation a primary size.

Both authors are of the opinion that simplified practice is feasible in the sand and gravel industry, and that there is an outstanding need for the reduction in the number of sizes. However, simplification or reduction in the number of sizes in their judgment is a matter to be handled locally in the large centers of production. Jointly they point out the obstructions that are in the pathway of simplification of sizes. Nationally, there is the geographic barrier. Materials on one side of this barrier are not identical with those on the other. The fragments of gravel on one side may not exceed 2 in.; while on the other there might be a preponderance of 3-in. fragments. Locally the largest obstruction is the engineers' creative pride—the desire to write into specifications their personal ideas on what makes the best construction.

The writer just recently became interested in the sand and gravel industry and is not thoroughly familiar with many of your problems. However, from my experience so far I must agree with the findings of Messrs. Lockwood and Jackson. One of the first things that came to the writer's attention since joining your industry was the lack of harmony between engineers in the same region when it comes to specifying the sizes of sand and gravel for construction work. During the past construction season our Pittsburgh producers have had many barges of gravel rejected by city employees because of size, and this rejected material was accepted the next day by state employees. The gravel was to be used by both branches of government for the same purpose and in the same part of the highway structure. Size was the only question at issue. Because of varied specified sizes, what was acceptable to one was objectionable to

* Discussion, Jan. 20, 1930 at Memphis convention, National Sand and Gravel Association.

the other. This is the local obstruction—the engineer's creative pride.

This variation in specified sizes prompted the writer to learn how many different sizes were specified locally. Examining but 11 specifications which control only a small part of the work performed in the tri-state territory served by the Pittsburgh sand and gravel producers, the writer found 51 sizes or what also may be termed gradations. The specifications examined included: the highway and bridge specifications of three states—Ohio, Pennsylvania, and West Virginia; of three counties; of one city, Pittsburgh; and of one borough; the specifications for plain and reinforced concrete structures of two railroad corporations; and a specification of the United States Government. The last mentioned specification was not for a specific construction project, but merely for the gravel to be used in general work by the government on the Monongahela River.

On analyzing these 51 gradations, it was found that, altogether, there were 29 different gradations specified for the gravel used as a coarse aggregate in concrete structures, and 28 gradations used elsewhere than in concrete. Separating the coarse aggregate gradations into the commercial sizes—small, medium, and large; it was found that there were 7 different gradations specified for the small size aggregate, 9 for the medium, 9 for the large, and 4 intermediate sizes. The last mentioned sizes were taken from specifications that require 5 different and distinct gravel gradations for the various concrete structures. Further analysis showed 6 different gradations of the large size aggregate specified for the concrete used in the highway base course. The maximum fragment size ranges in these 6 from particles that will pass a 2-in. screen to particles that will pass a 3-in. sieve, and similar variations occur in all of the gradations. The maximum percentages of intermediate sized pieces in some specifications is the minimum percentage in others.

These conditions in the Pittsburgh area or region are cited to show that what the industry needs is technical standardization in zones. To accomplish this, the producers' representatives must impress upon the local construction engineers the difference between nature's product and manufactured articles. While man can mould steel into almost any size, it is hard for man to put something into nature's storehouse it does not contain. If the sand and gravel deposit does not contain over 2-in. particles, it is hard for the producer to include in his delivery 3-in. particles.

The Pittsburgh producers have simplified their practices to the extent that each is producing the same commercial sizes. Now, they are striving to carry simplified practice to its full meaning by making reductions in the variety of quality, and to bring about reduction in the multiplicity of sizes, they are trying to establish locally technical standardization. The Pittsburgh producers' objectives include simplification and standardization.

Simplified Practice

(*Continued from page* 51)

worked out by the manufacturers, the Division of Simplified Practice has seldom had any real difficulty in "selling" the idea to all other interested groups. The division is entirely neutral and disinterested, holding no brief of the interests of any one group against those of another, and is therefore in a better position to sell an idea of this sort than is anyone directly concerned.

A number of projects have been suggested in connection with concrete aggregates and similar materials. The difficulties encountered so far have fallen into two main difficulties; one being geographical difference in the product itself and in local business conditions, and the other the difficulty of securing uniformity of specifications drafted by engineers and others. Neither of these difficulties is prohibitive, provided the manufacturers of the commodity itself really get together and co-operate. They will co-operate if they realize that anything which benefits the industry as a whole will benefit them as individuals in the long run. The truth of this statement has been proved many times over by the experience of hundreds of industries and thousands of individual firms. There is no reason to believe that the sand and gravel industry offers any exception to the rule. The producers have all the facts and figures, they know all the local conditions throughout the United States, and constitute the only group which can formulate a successful simplification program. After a considerable detailed study of this industry, and of its relation to other industries, the writer believes that a simplification program is not only feasible, but that it will greatly benefit every individual in the industry, including distributors and users, as well as producers. The Division of Simplified Practice stands ready to co-operate in this effort at any time.

Statistics of Cement for December

American portland cement mills continue to show a decline in the ratio of operations to capacity as indicated by the figures for 12 months' period ended December 31. According to statistics released by the Bureau of Mines, Department of Commerce, the ratio of operations for the last twelve months was 66.4 per cent. The ratio percentage has fallen from a maximum of 71.1 per cent for twelve months ended April 30 to 66.4 per cent for 12 months' period ended December 31, 1929.

Ready-Mixed Concrete, Possibilities for Producers*

By STANTON WALKER,
Director, Engineering and Research, National Sand and Gravel Association

THE production and marketing of ready-mixed concrete has developed into a comparatively large industry within only a few years. While central mixing plants, designed to serve one large job only, were used longer than 15 years ago, the practice of manufacturing concrete for the open market is not more than about five or six years old. Five years ago there were in the neighborhood of twenty-five plants in the United States engaged in the production and marketing of concrete delivered ready for use; today there are well over 100. The first plants were small and depended upon adaptations of ordinary equipment for the proportioning, mixing and transportation of the concrete. The inadequacy of the equipment limited the flexibility of the plant in furnishing different quantities and qualities of concrete and greatly restricted the radius of operation. Today equipment specially designed for the purpose is available which permits of ready changes in quantities and proportions and makes the radius of operation limited by considerations of economy rather than quality. Where the typical plant of a few years ago would attempt to service only the small jobs, the plant of today is prepared to handle almost any problem of furnishing concrete which may be submitted to it.

Stability of Industry

In spite of the rapid growth of the industry the question most frequently asked is whether ready-mixed concrete is here to stay. It gives every indication of being as permanent an institution as the concrete industry and existing plants, in general, seem to be showing a fair return on the investment. This does not mean that an unlimited expansion of present facilities is justified. Much is yet to be learned of its technique and economics; it is generally conceded that it should be entered only in the light of thorough knowledge of the problem. The use of ready-mixed concrete has developed so rapidly that no adequate analysis of its possibilities has ever been made; experience must be had before an accurate picture of its future can be drawn.

One of the best indications that the ready-mixed concrete industry fulfills a definite need is the difficulties encountered in performing the large amount of construction work in congested areas. Buildings are being torn down and replaced, streets are being widened and repaired, subways are being built, and many other types of construction are being carried on where traffic conditions do not permit of storage of materials or the establishment of a concrete-mixing plant. Under these conditions the logical source of supply is the ready-mixed concrete manufacturer.

Stanton Walker, director, Engineering and Research Division

The investment in equipment and overhead, which the contractor must make in order to produce his own concrete, offers still further justification for ready-mixed concrete. Idle equipment is expensive and the contractor should welcome the opportunity to turn as much of this burden as possible over to the ready-mixed concrete operator, who, due to the wider scope of his activities, is in a position to cut down idle time to the minimum. Not only the investment in equipment, but labor required for mixing, handling and storing materials, time-keeping and estimating must be considered. The saving in investment is not immediately apparent on account of available contractor's equipment, but that on hand will wear out in time, and, in addition, it seems logical to predict

*Paper presented before the National Sand and Gravel Association convention, Memphis, Tenn.

that much of it now in use will be diverted to places where ready-mixed concrete would not be practicable.

The increasing stringency in requirements for quality of concrete has been cited frequently as a justification for the ready-mixed concrete plant, and it is an excellent one. However, I have cited it last as I believe that, were there not other reasons based solely on the economics of the situation, developments in control methods applied to job plants would take care of this problem. Nevertheless, the fact remains that the ready-mixed concrete operator is in a much better position to control the quality of concrete than the job operator, although he must take full advantage of his opportunities in this respect if this factor is to be an important argument for the sale of his product.

Parallels in other branches of the construction industry indicate the tendency of the contractor to utilize finished materials as much as possible. The growing use of sub-contractors by the general contractor is a trend in that direction. The use of prepared plasters, mixed paints, fabricated reinforcing, special column forms, are steps toward standardization and specialization similar in effect to the development of the ready-mixed concrete industry.

The whole question of the permanency of the industry has its answer in accurate studies of the relative economy of centralized production and job production. Unless ready-mixed concrete can justify itself on this basis it is doomed to failure. It is my opinion that it can; there have been few instances where quantity production by specialists has not proven more economical than production by individuals primarily interested in the finished product. It should be emphasized that the chances of adequate return on an investment in the ready-mixed concrete field depend just as strongly upon the exercise of strict business principles as they do in any other business; faulty business methods will invite sure failure.

Field for Ready-Mixed Concrete

So far as quality is concerned, ready-mixed concrete, properly handled, can be adapted to almost any type of concrete construction within trucking radius of a plant. Its economy in comparison with concrete manufactured on the job will vary with the distance and with the nature of the work.

Up to the present time, ready-mixed concrete has been most popular in work for which the forms are readily accessible and for which a high degree of plasticity is not required. In general, also, most attention has been paid to the smaller jobs on account of the greater ease of servicing and the greater cost to the contractor of providing his own equipment. This has furnished a foundation for the growth of the industry and has given time for the development of methods for handling more complicated work.

The use of ready-mixed concrete for reinforced construction has become common and it has been used in a large volume of such work. This has required special consideration of methods of transportation and distribution over the job. More thought and planning are necessary than for the more accessible construction, but its use offers no problems which are not capable of solution. It is hoped that discussions from those in the business will describe methods which have been used.

The rapid expansion of the scope of the industry depends, to a large extent, on the cooperation which the operator can give the contractor in furnishing concrete when wanted and in sufficient quantity. The type of job which can be accepted, therefore, depends on whether or not means can be worked out to provide adequate service.

Admitting the stability of the ready-mixed concrete industry and the suitability of its product for use in practically all types of construction, there remain important questions to be considered in connection with the establishment of each plant. Is the community large enough, and growing rapidly enough to support a plant, and is the nature of the growth such as to provide a market for ready-mixed concrete? Is a site available which will permit of an economical operation? What capacity of plant and type of equipment will serve the needs of the community most economically? These questions, as well as many others, must be answered and answered accurately because the ready-mixed concrete operator is going into competition with an established and intelligently run industry.

Size of Community Necessary

No hard and fast rule can be stated for the size of community in which a ready-mixed concrete operation will be profitable. They are being run in towns as small as 15,000 population. Some who have studied the question say that a population of 70,000 is the minimum which will support a profitable business. If any figure is to be named, probably 40,000 to 50,000 should be stated as the minimum and then only where a study has shown favorable conditions. A community that is principally residential in nature, even though it is growing rapidly, offers few possibilities unless there are exceptional circumstances. A relatively small community with rapid industrial growth and with prospects for considerable public improvements may provide excellent opportunities.

The answer to the question of whether a community is large enough to justify the introduction of ready-mixed concrete will be found from adequate consideration of the following factors:

1. Volume of business required by the operator. For example, a business man can hardly expect to

receive a full-time salary for supervising an operation representing an investment of $30,000. On the other hand, if the supervision can be handled by a going organization, the investment of $30,000 in a ready-mixed concrete operation will, under favorable circumstances, make a fair return.

2. Annual consumption of concrete. Knowledge of the consumption of cement and concrete aggregates over a period of years will be of great assistance in studying this factor.

3. Proportion of the concrete-construction done annually which would afford a logical market for ready-mixed concrete. The determination of this factor will be the source of the most difficulty, since it involves complete consideration of such economic factors as location of plant, availability of materials, radius of operation, type of equipment and their relation to the cost of production. In other words, the cost of ready-mixed concrete in the forms as compared with the cost to the contractor, if he uses his own plant, must be known.

Location of Plant

The success of a ready-mixed concrete operation depends principally on its location. Raw materials for manufacturing the concrete should be readily available. Accessibility to the territory to be covered must be considered from the viewpoint of a central location and traffic conditions; the *time* required for delivery is of more importance than the *distance*. Ample space should be available for storage of materials in order that continuous operation may be assured.

The availability of raw materials is of prime importance. The most favorable condition is found in the use of a part of an existing material yard as the plant site. This eliminates expensive rehandling and provides a constant supply of aggregates; an important feature also, is the spare time use of trucks and, sometimes, bins and batchers.

Little can be given in the way of rules for the selection of a site, except to stress its importance. The cost of hauling materials to a ready-mix plant plus the cost of transporting the finished concrete to the job should compare favorably with the cost of hauling the raw materials direct from the source of supply to the job.

Capacity of Plant and Investment

Information on the investment required for different concrete-producing capacities is necessary in considering the desirability of establishing a plant, but conditions are so variable that no estimate which would be generally applicable can be given in this paper. Small plants have been built for as little as $20,000, and large plants have run to $500,000 or more. It seems to be generally agreed that it is necessary for transportation equipment to represent from 50 to 75 per cent of the total investment.

In order that some idea of the relation between investment and capacity may be presented to stimulate discussion, I venture to suggest that one-half cubic yard per year represents the approximate average capacity which may be obtained from an investment of $1.00 with the present costs of the most modern equipment, or, an investment of about $2.00 for each cubic yard annual capacity. Even a rough calculation of the cost of delivering a cubic yard of concrete on the job indicates that, for a fair return, the margin of sales price over cost of materials per cubic yard of concrete shoulld be about 25 per cent greater than the investment necessary to produce and deliver this quantity; and that means a gross sales of around four or five times the amount of the invested capital. These figures must not be considered as a proper basis for arriving at definite conclusions; however, they probably may be expected to give some ideas of the correct order of magnitude.

In deciding upon the capacity of a plant it must be kept in mind that probable peak loads as well as average requirements must be taken into consideration. It is the annual production which will decide the profitableness of the investment, but it is the peak load consumption which will dictate, to a large degree, the size of the plant and the investment.

It cannot be emphasized too strongly that accurate costs must be kept if the business is to be a success. These should include consideration of such factors as interest on investment, depreciation, cost of concrete materials, operating expense of plant, hauling costs, overhead, and sales. Probably the items most often underestimated are depreciation and hauling costs.

Equipment for Plant

Equipment for ready-mixed concrete operations, particularly transportation equipment, is still very much in the development stage. In general, there are two methods of producing and transporting concrete which are more or less related. These are (1) Batching plant and central mixer with trucks for transportation of the concrete to the job, and (2) batching plant and truck-mixers in which the concrete is transported to the job and mixed (either in transit or after arrival at the job). Opinion has not crystalized as to the merits of these two methods. Each of them has outstanding advantages which must be taken into consideration and which differ, depending on local conditions.

Batching Plant. Equipment for batching plants has been developed to some degree of standardization and, for that reason, may be passed over briefly. Principal emphasis should be placed on providing means for economical handling of materials and accurate measurement of quantities. Provisions should be made for heating materials

and the installation of any refinements which will add to the flexibility of the plant.

The most common form of construction provides for overhead bins for all materials which permit of their discharge by gravity into the measuring hoppers. Bins for three or more different sizes of aggregate must be provided if proper flexibility in quality of concrete is to be obtained. It is considered more economical to provide for the use of bulk cement where conditions permit, but sacked cement is often used. In some cases, the sacked cement is discharged direct to the mixer and in others it is emptied into a storage bin. In many cases it will also be necessary to make provisions for the handling of admixtures. The topic of handling materials at the plant could be developed into a considerable discussion but time does not permit.

Accurate measurement of materials is possible with existing equipment. A number of weighing batchers are on the market. Adjustable volume batchers are available. Volume batchers for measuring sand and compensating for bulking and moisture content have been in use for several years. Cement, unless it is handled direct to the mixer in sacks, must be weighed if sufficient accuracy is to be secured. To enter into a discussion of the relative merits of these different types of measuring devices is outside the scope of this paper. It can be said, however, that weighing devices provide the greatest flexibility where variable quantities and proportions are mixed.

Mixer. For a central plant sufficient mixer capacity should be provided to take care of peak loads and to load trucks with a minimum of lost time. Other conditions permitting, the capacity of the mixer and the capacity of the truck should be the same. The use of a small mixer in connection with larger-capacity hauling facilities cuts down the efficiency of the latter. The capacity for furnishing concrete is limited by the transportation equipment, and the additional investment required in mixer capacity to keep the trucks busy will be comparatively small.

According to one authority, a 1-cu. yd. mixer will handle quantities up to about 150 cu. yd. per day satisfactorily, a 1½-cu. yd. mixer up to 250 or 300 cu. yd., and a 3-cu. yd. mixer up to about 500 or 600 cu. yds. Where greater capacities are desired more than one mixer should be installed. Another authority, speaking with reference to the 3-cu. yd. mixer, points to the greater flexibility of smaller units and cites advantages of decreased charging and discharging time, less cumbersome proportioning equipment and less head room. He states that the increased daily capacity of a larger mixer over a small one is not as great as would be expected.

Trucks. Transportation equipment for ready-mixed concrete is in an earlier stage of development than batcher plants and central mixers. However, great strides have been made and the problem seems in a fair way to solution. A truck for transporting concrete which will prevent segregation, eliminate leakage, permit of convenient discharge of the concrete, be comparatively light in weight, and (considered highly important by some) permit of being used for other purposes, is the aim of the industry.

The first ready-mixed concrete was delivered in trucks with ordinary dump bodies. These served fairly satisfactorily so long as a high degree of workability in the concrete being delivered was not required. However, they permitted loss of water with consequent reduction in workability and were difficult to discharge. They have been practically eliminated from service and replaced with special designs to eliminate leakage and to facilitate dumping. The truck with the water-tight body and easy dumping facilities serves the purpose admirably so long as segregation can be avoided. Unfortunately, except for quite dry concrete or short hauls, it seems difficult to handle concrete in them without segregation.

The broadening of the field of ready-mixed concrete to include building construction, which requires a relatively high degree of plasticity, caused the development of trucks specially designed to prevent segregation. These are, in general, of three classes: (a) special bodies designed to remix the concrete while dumping, (b) agitators, and (c) truck-mixers. Most activity seems to be directed to the development of the latter two classes, which reduce difficulties due to segregation to a minimum and remove limitations on plasticity.

(*Continued in next issue*)

Where Salt Is Produced

The salt deposits in the United States that furnish salt for commercial purposes are, with the exception of small deposits used for local supply, confined to definite regions in the northeastern, south central, and western parts of the country. Michigan, New York, and Ohio, included in the first group, have furnished 72 per cent of the total salt sold or used by producers in recent years, according to statistics gathered by the United States Bureau of Mines, Department of Commerce. Kansas and Louisiana, in the central belt of States, are the next largest producers and California is chief among the Western States.

The salt is marketed as evaporated salt and as rock salt. Salt brine is drawn from wells by several chemical manufacturers, and the salt content is used by them in their manufacturing processes. Bittern, the residue from some of the salt works, is sold to chemical manufacturers for further treatment and for the recovery of bromine and calcium chloride.

Feldspar Grinders Hold Conference at Bureau of Standards

PURSUANT to a request of the Feldspar Grinders' Institute a general conference on feldspar was held January 14, 1930, at the Bureau of Standards, Washington, D. C. The purpose of this conference was the establishment of the industry's own classification for grades of feldspar by and with the co-operation of grinders, distributors, and consumers in order to arrive at a common basis of understanding in every day trade. A proposed standard developed by the Feldspar Grinders' Institute was used as the basis of discussion. The following were in attendance:

Adams, Wm. L., Jr., manager, Oxford Mining & Milling Co.
Amberg, Chas. R., prof. ceramic engr., Alfred University.
Barringer, L. E., engr. of insulations, General Electric Co.
Bowles, Oliver, supervising engr., Bureau of Mines, and American Institute of Mining and Metallurgical Engineers.
Brockman, E. D., Roessler & Hasslacher Chemical Co., The.
Brown, Geo. H., director, Dept. of Ceramics, Rutgers University.
Burgess, B. C., manager, Tennessee Minerals Products Co.
Flint, F. C., chief chemist, Hazel Atlas Glass Co.
Earnill, T. C., director, research and development, Owens-Illinois Glass Co.
Frink, R. L., consulting engineer, Lancaster, Ohio.
Golding, Chas. E., president, Standard Flint & Spar Corp.
Fuller, D. H., ceramic engineer, Washington, D. C.
Hadley, J. M., sec., standardization division, American Mining Congress.
Hamilton, James, gen. supt., Trenton Potteries Co.
Hanna, Henry N., sales executive, Seaboard Feldspar Co.
Herr, Horace H., "Ceramic Industry."
Hill, G. C., supt., Locke Insulator Corp.
Kelsey, V. V., sales manager, Consolidated Feldspar Corp.
Knight, Frank P., Jr., chief chemist, United Feldspar Co.
Koenig, E. W., chief chemist, Consolidated Feldspar Corp.
Lawson, Robert W., vice-president, Consolidated Feldspar Corp.
Malsch, W., mgr. ceramic dept., Roessler & Hasslacher Chemical Co., The.
Manor, J. M., v.-p. and gen. mgr., The Golding Sons Co.
Margerum, H. P., president, Erwin Feldspar Co.
McComas, Clarence B., chief chemist, Carr-Lowrey Glass Co.
McLear, H. G., vice-president, Green Hill Mining Co., Inc.
Parker, W. J., commissioner, Feldspar Grinders' Inst.
Parmelee, C. W., head, dept. ceramic engineering, University of Illinois.
Peddrick, C. H., Jr., vice-president, United Feldspar Corp.
Porst, E. G., chemist, Porcelain Enamel & Mfg. Co.
Richard, Harry A., salesman, Roessler & Hasslacher Chemical Co., The.
Rodgers, Joseph P., sec.-treas., Seaboard Feldspar Co.
Schramm, Edward, chemist, Onondaga Pottery Co.
Schurecht, H. G., research associate, National Terra Cotta Society.
Shearer, Walter L., chemist, Rouse & Shearer, Inc.
Thropp, Herreld D., vice-president, Eureka Flint & Spar Co.
Turner, James, treasurer, Trenton Flint & Spar Co.
Wainford, R. H., president, Trenton Flint & Spar Co.
Walker, Myron R., U. S. Tariff Commission.
Watts, Arthur S., prof. ceramic engineering, Ohio State University.
Weis, J. H., manager, United States Feldspar Corp.
Wilkes, John C., general manager, Eureka Flint & Spar Co., Inc.

Representing the Department of Commerce

Bates, P. H., chief, div. of clay & silicate products, Bureau of Standards.
Harrison, W. N., chief, enamel section, Bureau of Standards.
Judson, L. V., chief, length section, Bureau of Standards.
Sligh, W. H., assistant physicist, Bureau of Standards.
Wray, G. W., junior scientist, Bureau of Standards.
Steidle, Harry H., division of trade standards, Bureau of Standards.

The conference was opened by Dr. George K. Burgess, director of the Bureau of Standards, who welcomed those in attendance and offered the co-operation of the bureau in the settlement of the industry's mutual problems.

The chairman of the conference briefly outlined the procedure in developing commercial standards of quality through the division of Trade Standards of the Bureau of Standards and then introduced B. C. Burgess, chairman of the standardization committee of the Feldspar Grinders' Institute, who led the discussion of the proposed standard classification for feldspar.

The detail requirements of the proposed standard were freely discussed. Regarding the physical classification, it was suggested that additional fineness groups should be added, particularly that commonly referred to as 325-mesh.

Regarding the chemical classification, there were differences of opinion. There were suggestions for additional groups with silica content below 68 per cent and upon the basis of comment submitted by mail from the Republic Stamping & Enameling Company it was voted to provide silica groups below 68 per cent. One designated number 66 will include those up to and including 66 per cent, while another designated number 67 will include those above 66 per cent up to and including 68 per cent.

The question of potash-soda ratio was also discussed and it was voted to make a group of 6 or more to 1 designated number 61.

Upon consideration of the third group of spars used for the manufacture of glass it was indicated that these standards were somewhat inadequate for glass manufacturers, and upon motion of Mr.

F. C. Flint, seconded by Mr. Joseph P. Rodgers, it was voted that a subcommittee representative of the glass industry and the feldspar grinders be formed to draft a classification for feldspars suitable for the manufacture of glass.

After mature deliberation it was thought best to refer the whole matter of feldspar classifications to a committee of the industry. Upon motion of C. H. Peddrick, Jr., seconded by R. H. Wainford, it was voted that a committee of the feldspar industry be appointed to revise the proposed commercial standard for feldspar using the revisions and suggestions made at today's meeting as a basis and that this committee be authorized to recommend a commercial standard for feldspar which will be presented directly to the industry for formal acceptance. The committee is to be composed of four members of the feldspar grinding industry, one representative of ceramic schools, one representative of the Bureau of Standards, and six representatives of feldspar consumers divided as follows: three manufacturers of whiteware, two of glass, and one of enamel.

The personnel of this committee is as follows:

B. C. Burgess (chairman), manager, Tennessee Mineral Products Co., feldspar grinders.

Chas. E. Golding, president, Standard Flint & Spar Corp., feldspar grinders.

V. V. Kelsey, sales mgr., Consolidated Feldspar Corp., feldspar grinders.

Joseph P. Rodgers, sec.-treas., Seaboard Feldspar Co., feldspar grinders.

Arthur S. Watts, prof. ceramic engineering, Ohio State University, ceramic schools.

P. H. Bates, chief, Clay & Silicate Products, Bureau of Standards.

James Hamilton, supt., Trenton Potteries Co., whiteware mfr.

Edw. Schramm, chemist, Onondaga Pottery Co., whiteware mfr.

L. E. Barringer, engr. of insulation, General Elect. Co., whiteware mfr.

F. C. Flint, chief chemist, Hazel-Atlas Glass Co., glass mfr.

T. C. Earnill, director, research & development, Owens-Illinois Glass Co., glass mfr.

H. G. Wolfram, director of research, Porcelain Enamel & Mfg. Co., enamel mfr.

Harry H. Steidle, ex-officio secretary, Division of Trade Standards, Bureau of Standards.

Tentative arrangements were made for a meeting of this committee during the convention of the American Ceramics Society at Toronto, Canada, during the week of February 16.

F. C. Flint was made chairman of the subcommittee which he was authorized to form to consider feldspar classifications for the glass industry. He will meet with this committee and present its findings to the general standardization committee of the industry at their February meeting.

National Management Congress

The program of the National Management Congress to be held in Chicago, March 3-4-5, promises exceptional papers and speakers for this event. Nine sessions have been arranged, opening with an address on "Some Economic Aspects of Management in the Future" and following with addresses on "The Development of Organized Management, Science and Philosophy since Taylor," the main theme running through the entire conference being —"Organizing for Permanent Prosperity."

In the technical sessions, of which there will be six, subjects of Progress in Distribution Methods, Simplification and Mechanization in the Administrative Field, Plant Maintenance, Wage Incentive Plans, Industrial Education and Training, and the Machine Age—re-adjustments in industry due to mechanization.

In this Congress also will be held the first meeting of the American Society of Mechanical Engineers Committee on Elimination of Waste, and a special session has been arranged under the general title of "Reclamation and Utilization of Wastes," which will be the beginning of the 1930 campaign in this work. Speakers, having already accepted, include such names as: Henry Kendall, Boston, Mass.; W. H. Leffingwell; W. P. Tuttle; John M. Carmody, Pres. Soc. of Ind. Engrs.; W. T. Galloway; John Paul Jones, and several others of like standing in the industrial and management fields.

The societies sponsoring the Congress include the Society of Industrial Engineers, American Society of Mechanical Engineers, American Management Association, the National Association of Cost Accountants and the National Association of Foremen.

It is apparent from the interest already shown that this endeavor will be one of the most outstanding of its kind ever held and offers possibilities for ideas and policies which are in direct keeping with the tendency of the times at present.

Varieties and Occurrence of Feldspar

Feldspar, or "spar" as it is commonly called by miners, is a general name for a group of rock-forming minerals that vary somewhat in composition. The most important varieties from a commercial standpoint are orthoclase, or potash feldspar, and microcline which has the same composition as orthoclase and differs only in crystal form; these varieties constitute the great bulk of the feldspar that finds commercial use. Albite, or soda feldspar, anorthite, or lime feldspar, and mixtures of these are used to some extent.

Feldspar forms a considerable part of such common and widespread igneous rocks as granites, in which it occurs in grains varying in size from that of a pinhead to one-half inch or more in diameter, says the United States Bureau of Mines, Department of Commerce, in a recently issued publication.

Oakfield Gypsum Products Corporation's Plant Features Safety and Economy of Operation

One of Outstanding Operations in World's Greatest Gypsum District

By W. E. TRAUFFER

THE Oakfield Gypsum Products Corporation operates a compact and efficient plant about 3 miles west of Oakfield, N. Y., in the heart of the greatest gypsum producing section in the state and one of the largest in the world. The plant, which incorporates all of the latest developments in the industry, has a capacity of 300 tons per day of finished stucco, wall plaster and plaster of paris, and has been in operation about eight years.

The gypsum rock deposit is of excellent quality and averages about 43 per cent SO_3. The mine which was opened before the plant was erected is working a 5-ft. vein 75 ft. below the surface. Under this is another vein of gypsum which has never been worked. Scranton Electric Construction Company's electric driven mine drills and a special type of explosive are used. The gypsum is loaded by hand into 3,000-lb. capacity steel mine cars. These are hauled in trains of 15 or more cars by a two-motor Goodman Manufacturing Company 6-ton trolley-type electric mine locomotive to the foot of the mine lift. The vertical lift is of the balanced type with two steel cages and a steel head frame. The loaded cars are run onto these cages in the mine and alternately elevated to the plant. The lift is operated by a single-drum opposite-wound Flory hoist which is driven by a 25-hp. General Electric motor. The hoist is housed in a tile block building near the head frame.

Supt. H. W. Olmsted in doorway of plant office

The mine cars automatically dump their loads into a weigh hopper, within the plant, which is equipped with a Buffalo scale and a Weightometer which speeds up weight reading. This hopper is located on a steel platform which also contains all of the controls for the lift. A remote control system operates the lift hoist. A private telephone connection with the mine keeps the operator in touch with the man loading the cars onto the cages in the

General view of Oakfield Gypsum Products Corporation plant with machine shop and hoist house at left and office at right

Type of drilling operation used in the mine

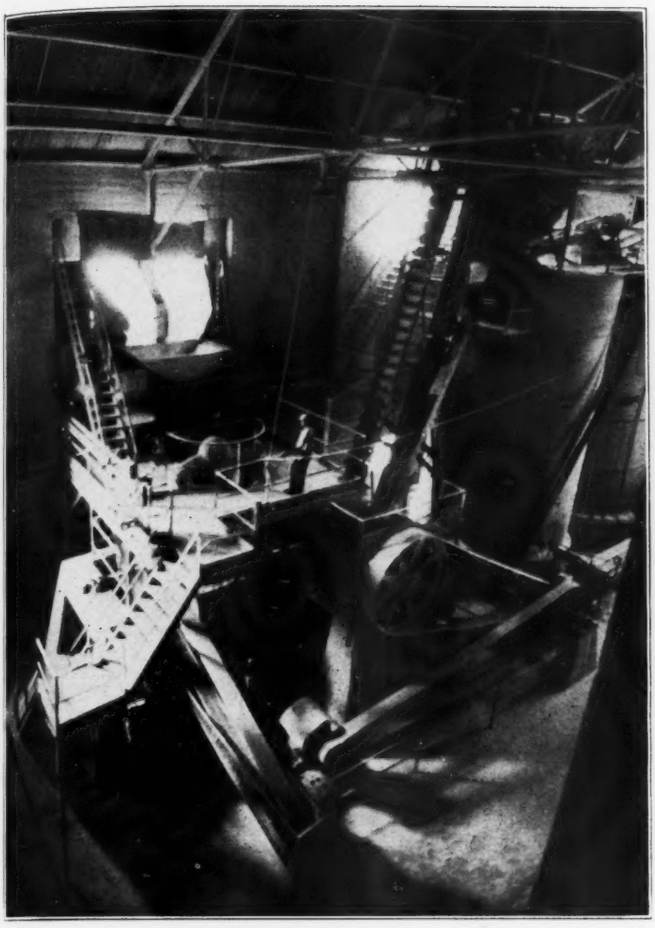
mine. To insure absolute safety and prevent any misunderstanding of signals due to crushing noise, there is, in addition to a bell signal operated from the foot of the mine shaft, an auxiliary electrical attachment which automatically lights a green lamp when the bell rings and stays lit until the hoist operator repeats the signal.

The gypsum rock discharges from the hopper into a Traylor primary gyratory crusher. This discharges to a special type Jeffrey chain bucket elevator on 40-ft. centers which feeds a Stephens-Adamson roll grizzly with 1-in. spacing. The oversize goes through a chute to a Traylor double-roll crusher for final reduction. This discharges back into the same elevator to the roll grizzly thus sizing all the crushed rock. The primary crusher is belt-driven by a 50-hp. Allis-Chalmers motor. The roll crusher and the roll grizzly are belt-driven from the same 30-hp. Allis-Chalmers motor.

The material passing through the grizzly is chuted into two 100-ton capacity circular steel bins. A short belt conveyor can also feed to an 800-ton capacity steel bunker outside of the building. The bunker discharges through four gates to lateral drag-chain conveyors feeding a belt conveyor. Each of the smaller bins also discharges by a drag-chain conveyor to another belt conveyor. Both of the conveyors are driven through James speed reducers. They discharge to a Jeffrey steel-enclosed bucket elevator feeding a belt conveyor which discharges into the calciner feeder bin. A Dings magnetic separating head pulley on this conveyor removes all metal particles.

Another view of the plant

Conveyor in background with magnetic separating head pulley feeding elevator driven through speed reducer which discharges through chutes to hammer mill at right



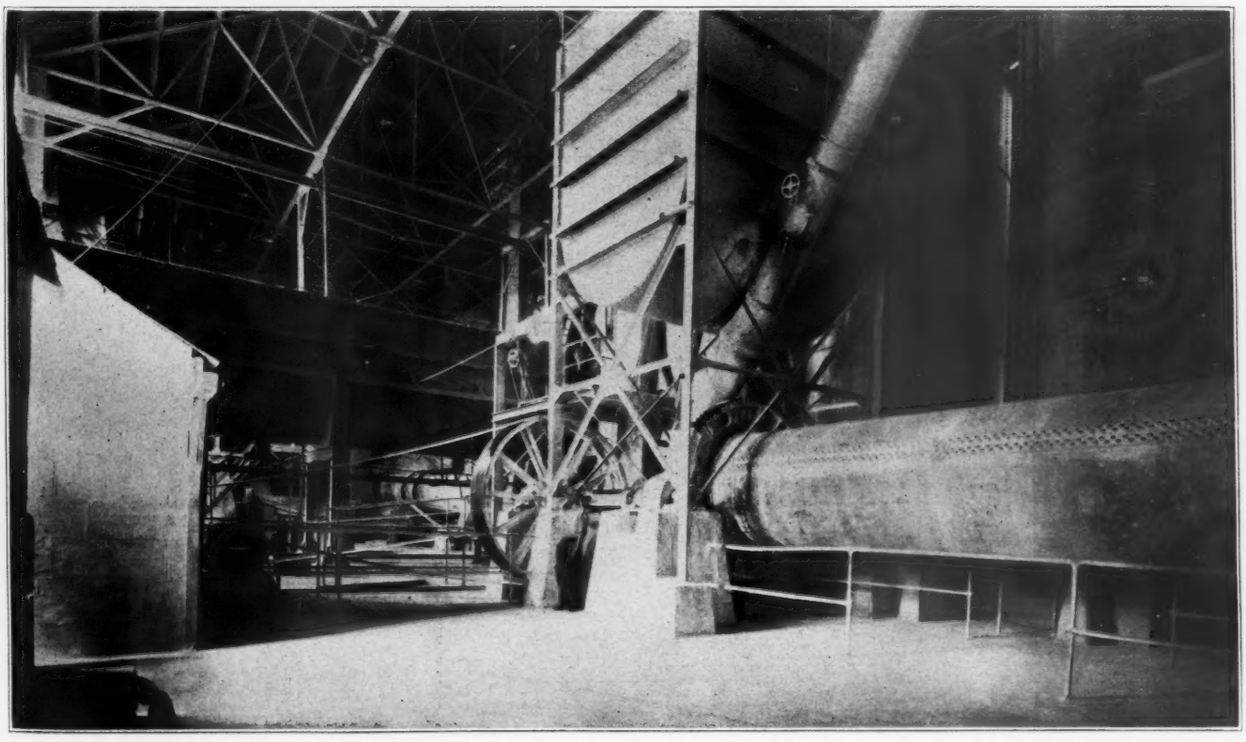
Primary and secondary crushers with elevator to grizzly bins at right

A plunger-type feeder discharges into the 6-ft. by 70-ft. Bonnot rotary calciner. This is bricklined with a movable firing hood and uses powdered coal as fuel. A Bristol electric recording pyrometer keeps a record of the temperature of the calcined rock as it is discharged from the calciner.

The calciner discharges into a conveyor to a bucket elevator which feeds a screw conveyor which in turn discharges through openings into three 100-ton capacity circular steel bins similar to those previously described. These bins discharge by drag-chain conveyors to a belt conveyor feeding the elevator to a hammer-mill. This conveyor is also driven through a James speed reducer and has a Dings magnetic head pulley.

Lars Vorren in the chemical laboratory

The Williams No. 3 hammer-mill is belt-driven by a 75-hp. Allis-Chalmers motor and discharges to an elevator. This feeds a 5-ft. by 22-ft. solo tube



Rotary Calciner in background, storage tanks and air-swept tube mill at right. Coal bin at left

Headframe over shaft from mine

mill with a Kennedy-Van Saun air swept system and other modern grinding equipment. The finely ground material is drawn into a fan and elevated to an 8-ft. dust collector which in turn discharges to a distributing screw conveyor over three 125-ton capacity steel storage tanks.

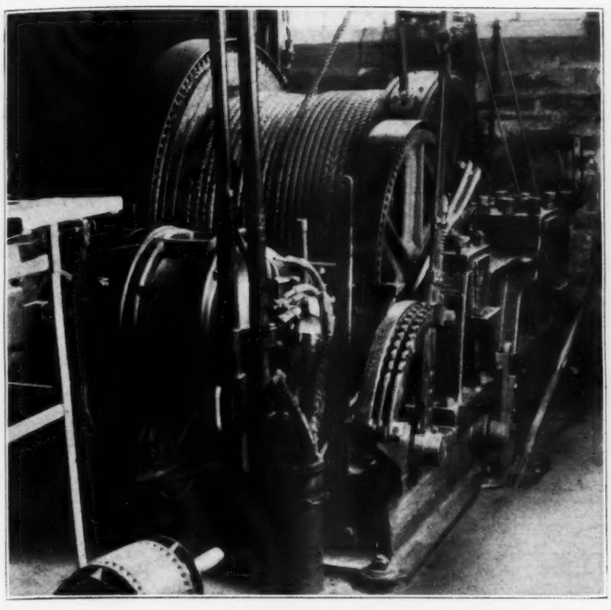
These tanks discharge by drag-chain and belt conveyors to an elevator feeding a 50-ton capacity steel bin on the third floor of the packing building. A short screw conveyor draws from this to a Bates 4-bag stucco packer on the second floor. Two screw conveyors also feed to two Broughton mixers where the usual ingredients for wall plasters are added. These mixers discharge to a Bates 4-bag packer and a 6-bag draw packer. Bags are loaded into cars on a siding along both sides of the plant.

Sand, fibre, hair and other items are used as admixtures in the various products. The washed sand is shipped in and is fed from the cars by a portable conveyor to an elevator or to storage pile. This elevator discharges to a Paragon Plaster and Supply Company steam dryer, from which it is stored in tanks and used as desired. Fibre, hair and empty sacks are stored on the third floor. A hair picker discharges into a fireproof bin on the second floor from which the material is taken and re-picked as needed. There is also a Guthat rotary bag cleaner on the third floor. All packers are connected to an Empire Blower Company dust collecting system.

All of the screw conveyors, drag-chain conveyors and bucket elevators were furnished by the Jeffrey Manufacturing Company. All belt conveyors are driven through James speed reducers. Crouse-Hinds electrical conduit is used throughout the entire plant. Electric power is received from Niagara Falls which is about 50 miles from the plant. Direct current for the mine locomotive and drills is generated in the plant power house.

Coal is discharged from cars into a track hopper

Coal bunker and pulverizing equipment at right, with rotary calciner in background



The two-drum electric hoist operating the mine cages

Electric locomotive in mine hauling loaded cars to shaft

from which it is handled by a Godfrey coal-handling and storage system. A clamshell bucket traveling on a steel overhead track takes the coal from the track hopper either to yard storage or to a bunker inside of the mill. A drag scraper rehandles coal from storage so that it may be recovered by the bucket.

The steel coal bunker inside the building has a 2-car capacity. It discharges by belt conveyor to an enclosed bucket elevator feeding a smaller storage bunker. This feeds by a drag-chain conveyor to an Aero Pulverizer Company paddle-type coal pulverizer which pulverizes and blows the coal into the calciner. This pulverizer is driven by a 50-hp. Allis-Chalmers motor. An electric thermostat controls a small variable speed motor which in turn controls the temperature of the rock flowing out of the calciner by regulating the speed of the coal feed. The belt conveyor from the large coal bunker also has a Dings magnetic separating pulley.

The plant has its own water system and is completely equipped with O. J. Childs Co. fire ex-

Mixers above the packers. The draw packer is used mainly for sanded plaster, the other for neat plaster containing wood fiber

The four-tube stucco packer and some of the sack storage space in the plant

tinguishers. On the third floor of the main plant building where some inflammable material is stored there is a portable two-wheeled Foamite fire fighting apparatus.

The plant has a very good safety record which has been due to the many sensible precautions taken. All moving machinery is either enclosed or has guard rails around it and all bucket elevators are steel enclosed. Beginning with the first of the year 1929 the plant and mine operated 233 days without a lost-time accident and completed the remainder of the year without having one.

The main plant building has a structural steel framework with Denison tile curtain walls and reinforced concrete floors. Truscon steel window sash and H. H. Robertson Co. non-corrosive corrugated protected metal roofing are used. This building is 300 ft. long by 60 ft. wide and is 36 ft. high to the eaves. All other buildings are of tile and concrete construction. These include a machine shop, power house, hoist house, wall board store house and a two-story building which houses the plant offices and the chemical and testing laboratory.

The plant is connected by a ½-mile siding with the West Shore Railway-Buffalo to Newark branch of the New York Central railroad. The products of the plant are shipped out in carload lots to material dealers on orders from the Paragon Plaster Company of Syracuse, the American Hardwall Plaster Company of Utica, and the Paragon Plaster and Supply Company of Scranton, Pa., all of which are affiliated companies. This company also owns ten Dennison tile constructed workmen's cottages which it supplies with running water and electricity. There is also a commodious frame farm house and barns, maintained for the use of the employee operating the company farm property.

The main office of the Oakfield Gypsum Products Corporation is at 300 West Water Street, Syracuse, N. Y. Officers are: W. K. Squier, president and purchasing agent; E. L. Merriman, vice-president and secretary; Thomas P. Eldred, treasurer. H. W. Olmsted is superintendent at Oakfield and Lars Vorren is chief chemist.

System of Accounts for Slate

Simple systematic accounting that adequately records all transactions has long been regarded as essential to the welfare of any business enterprise. Some of the defects that detract from the prosperity of the slate industry are attributable to a lack of effectiveness in cost keeping. This condition has prompted the United States Bureau of Mines to make a detailed study of accounting methods for the slate industry, and to present for consideration a system of accounts, which it is believed would enable the industry to attain more economical management and operation if accepted by a fair proportion of its important units.

In Serial 2971, by Oliver Bowles, there is presented a method of accounting which has been worked out with the assistance of leading slate producers.

Sand and Gravel Association Meets in Memphis

(*Continued from page* 46)

of Concrete," the full text of which appears elsewhere in this issue. He stated that the characteristics which he discussed had no relationship to the general types of aggregates, such as crushed stone, gravel, or slag, but that they were such features as soundness, durability, hardness, strength, surface texture, shape, deleterious coatings, size, and sometimes specific gravity and mineral components. There is little difference between concretes made with rounded and angular pieces if all other factors and conditions are similar, the question being largely economic.

D. D. McGuire, engineer for the Tennessee Highway Department, read an interesting discussion of Mr. Walker's paper, and made the assertion that the most important factor in the preparation of concrete is a strong cement mortar. For perfect concrete the aggregates must possess as great strength as the mortar. He believes that close gradations of aggregates is not necessary.

J. C. Buckbee, chairman of the association's committee on Cost of Cleaning and Repairing Railroad Cars, next read the report of that committee. He furnished data concerning the average use by sand and gravel shippers of solid-bottom, drop-bottom, and hopper cars, and found that the drop-bottom type cars are the most difficult to clean. The committee recommends the propogation of an order that every consignee be required to clean freight cars before they are accepted by the railroad for reconsignment, with demurrage charges until compliance is effected.

At this point Secretary Ahearn read a letter from W. J. McGarry, who had been detained by conflicting duties. The letter explained the interest of the American Railway Association in Mr. Buckbee's report, and stated that several railroad companies are remodeling their drop-bottom cars into solid bottoms.

Convention Resolutions

John Prince, of the Stewart Sand Co., of Kansas City, Mo., presented several resolutions which were adopted unanimously by the convention. These covered: co-operation with the Memphis Chamber of Commerce in its program of flood control and river navigation which is to be discussed this coming spring at a congress in Memphis; desirability of a petition to the federal Trade Practice Commission for a conference to consider rules in the sand-and-gravel industry; the proper control of labor problems in federal and state penal institutions to obviate competition with legitimate operations; and appreciation of the efforts of the local members, including W. W. Fischer and L. T. McCourt, who contributed generously to the success of the convention.

Hugh Haddow, Jr., of the Menantico Sand and Gravel Co., Millville, N. J., chairman of the nomination committee, then offered the names of nominees for the executive offices of the association for the ensuing year, first paying compliments to R. C. Fletcher, retiring president. The following members were elected unanimously:

President—Robert J. Potts, of Potts-Moore Gravel Co., Waco, Texas.

Vice-President—H. V. Owens, of Eastern Rock Products, Inc., Utica, N. Y.

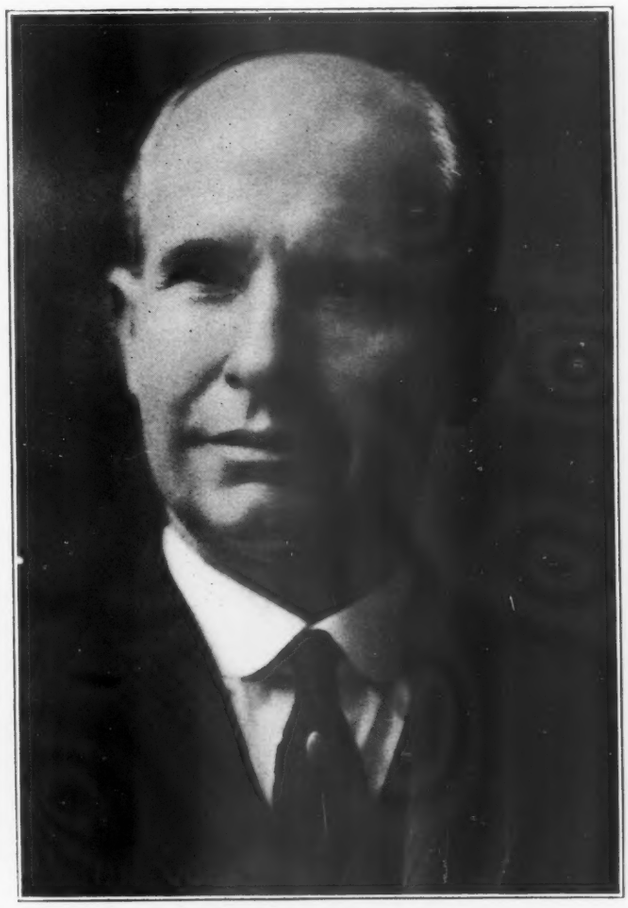
Secretary-Treasurer—H. S. Davison, of J. K. Davison & Bro., Pittsburgh, Pa.

Directors at Large—F. W. Peck, Peck-Thompson Sand Co., Kansas City, Mo.; W. H. Gemmer, Texas Construction Material Co., Houston, Texas; Alexander Foster, Jr., Warner Company, Philadelphia, Pa.

Members of the Executive Committee, in Addition to the Principal Officers—H. R. Battjes, Grand Rapids Gravel Co., Grand Rapids, Mich.; J. C. Buckbee, Northern Gravel Co., West Bend, Wis.; F. W. Peck; Alexander Foster, Jr.

By previous elections in their respective districts, the following are regional directors:

David Alexander, Petersburg, Va.
C. E. Alexander, Knoxville, Tenn.
H. N. Battjes, Grand Rapids, Mich.
M. B. Garber, Lorain, O.
Hugh Haddow, Jr., Millville, N. J.
F. E. Hall, Cincinnati, O.
Walter F. Jahncke, New Orleans, La.



Robert J. Potts, president, National Sand and Gravel Association

A. C. Birnie, North Wilbraham, Mass.
J. C. Buckbee, Chicago, Ill.
F. D. Coppock, Greenville, O.
V. A. Cordes, Memphis, Tenn.
Alex. W. Dann, Pittsburgh, Pa.
H. M. Davison, Milwaukee, Wis.
R. C. Fletcher, Des Moines, Ia.
V. O. Johnston, Lincoln, Ill.
C. F. Mullen, Columbus, Ga.
John Prince, Kansas City, Mo.
F. W. Renwick, Chicago, Ill.
J. L. Richmond, Huntington, W. Va.
G. G. Robinson, Toronto, Ont.
J. M. Settle, Louisville, Ky.
J. L. Shiely, St. Paul, Minn.
H. E. West, Muskogee, Okla.

Upon motion of Walter L. Smith, a rising vote of thanks and appreciation was extended to Mr. Fletcher as he yielded the presidency to Mr. Potts, the new president then making appropriate remarks of acceptance upon being introduced by Vice-President H. V. Owen.

Stanton Walker was scheduled to present the annual report of the director of the Engineering and Research division, but he forewent the presentation and referred members to the printed report.

John Prince, of the Stewart Sand Co., Kansas City, Mo., then substituted for N. C. Rockwood, who had been called from the convention, in presenting the safety trophy donated by *Rock Products*. The trophy, a handsome bronze tablet, was awarded to the plant of the American Aggregates Corp., at Brighton, Mich. Honorable mention was given to the Yahola Sand and Gravel Co., Muskogee, Okla.

Mr. Fletcher then spoke in complimentary terms of the services that had been rendered during his presidency by Secretary Ahearn and Research Director Walker.

J. C. Buckbee spoke upon the benefits that members might derive by safety programs, in decreasing rates for compensation insurance. During the discussion of this matter it developed that there are approximately 1,100 sand and gravel companies in the country, but that less than 200 companies handle 75 per cent of the total production.

Secretary W. F. Wise, of the National Crushed Stone Association, then offered the suggestion that his association and the National Sand and Gravel Association co-operate in the regular employment of a safety engineer. It being late in the session, no definite action was taken in the matter, but President Potts stated that the executive committee would give careful consideration to the proposal, which was called for Friday forenoon.

The convention then adjourned permanently.

Ladies' Program

A very interesting program was arranged for the women guests at the convention by Mrs. Walter Lane Smith, assisted by Mrs. H. S. Hayley, Mrs. V. A. Cordes, Mrs. L. T. McCourt, and Mrs. Jack Foules, all of Memphis.

Exhibit at Memphis convention of National Sand and Gravel Association

After registration on Tuesday morning, a reception was held in the Italian Room of the Hotel Peabody. Later all of the ladies were driven to the Memphis Country Club for luncheon, followed by a bridge party. The winner at each table was presented with a vanity case. In the evening those who wished to do so attended the informal dinner and dance at the Hotel Peabody.

On Wednesday morning there was a very interesting trip through the Federal Compress, which is the largest cotton compress in the world. Mrs. Walter L. Smith then was hostess at her residence, where a delightful luncheon was served. In the evening all attended the annual banquet and dance at the hotel.

Thursday morning was devoted to a shopping tour through the principal department stores of Memphis and a trip to the top of the new thirty-eight-story Sterrick Building. This is the highest building in the South and commands a view of the city and the Mississippi River for many miles in both directions. At noon the ladies attended the luncheon in the Italian Room of the Hotel Peabody, which completed the program.

Manufacturers' Exhibits

The Exhibit of the Manufacturers' Division was held in the Lobby and on the Mezzanine Floor of the Hotel Peabody. The attendance at this exhibit was very gratifying, being due to some extent to the prominent location.

List of Exhibitors and Description of Exhibits

Allen Cone and Machinery Corp., New York City.
Operating model of Allen sand cone with centrifugal pump, etc. Descriptive literature.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Literature on general crushing and screening equipment featuring vibrating screen and Newhouse crusher. Special busses were run on Wednesday afternoon to the plant of the Central Sand and Gravel Company near Memphis where a 10-in. Newhouse crusher and vibrating screen in operation were on exhibition. A large num-

ber took advantage of this opportunity and were tendered a barbecue at the plant.

American Manganese Steel Co., Chicago Heights, Ill.
Miniature operating model of dredge ladder and centrifugal pump. Photos of various items of equipment including dippers and screens and descriptive literature.

Barber-Greene Co., Aurora, Ill.
Showed a display cabinet with three separate movies showing bucket loaders and belt conveyors with Leahy screens. Also descriptive literature.

Bartlett, C. O., and Snow Co., Cleveland, O.
Photos of agitator trucks in operation and descriptive literature.

Bennett, W. H. K., Co., Chicago, Ill.
Exhibited operating model of dredge pump and Diamond cutter made by Pettibone-Mulliken Co. and distributed by Bennett. Also descriptive literature.

Blaw-Knox Co., Pittsburgh, Pa.
Descriptive literature.

Bucyrus-Erie Co., South Milwaukee, Wis.
Showed operating model of 4-cu. yd. Model 120 B full-revolving all-electric Bucyrus-Erie crawler shovel operated by full-size controls and handling real materials. Also descriptive literature.

Buda Company, Harvey, Ill.
Exhibited Model D 430, 120-hp. diesel engine power unit (compressorless type) for operating rock crushers, sand pumps or other plant machinery.

Cincinnati Rubber Mfg. Co., Cincinnati, O.
Showed samples of dredge sleeves, conveyor belting chute reliners, etc. Also samples of pure smoked sheet rubber, descriptive literature and photos of product in actual service.

Cross Engineering Co., Carbondale, Pa.
Exhibited various sizes of perforated metal screen cloth in various sizes, weights and shapes and descriptive literature.

Deister Machine Co., Fort Wayne, Ind.
Exhibited full size 3-ft. by 6-ft. triple-deck Plat-O vibrating screen in operation. Also descriptive literature.

Dorr Company, New York City
Exhibited operating models of Dorrco sand washer and bowl classifier, photos and descriptive literature.

Dravo Contracting Co., Pittsburgh, Pa.
Showed complete exhibit of photos showing equipment in operation as well as motion pictures and descriptive literature. Two-foot folding steel rules were given as souvenirs.

Eagle Iron Works, Des Moines, Ia.
Showed working model of Eagle flume classifier, gravel washer and Eagle Swintek screen nozzle ladder.

Fairbanks, Morse & Co., Chicago, Ill.
Exhibited photograph panels of diesel engines, motors, pumps and other equipment used in sand and gravel field. Also a sectionalized motor-driven ball-bearing centrifugal water pump and descriptive literature.

General Electric Co., Schenectady, N. Y.
Featured a miniature electric train operated by voice control with a photo-electric control through a thyratron tube which lights an electric sign from the rays of the headlight of the locomotive without the use of relays or switches. Also exhibited a streamer discharge argon tungsten equipment showing the behavior of small negatively charged particles of tungsten in an electric arc. Also a photo-electric meter for measuring light intensity.

Good Roads Machinery Co., Inc., Kennett Square, Pa.
Exhibited quarter-size miniature working model of No. 1030 roller-bearing Champion fine-reduction crusher with samples of crusher-run stone, a model sand wash box and working model of new vibrating screen. Also showed photos of plant installations and literature.

Harnischfeger Sales Corp., Milwaukee, Wis.
Exhibited miniature model of Model 600 full revolving crawler shovel and an operating model of Model 400 clamshell crane. Also a complete set of photos showing equipment in use and descriptive literature.

Hayward Company, New York City.
Showed models of Classes E and K clamshell buckets and dragline bucket and moving pictures showing them in actual use. Descriptive literature.

Hendrick Mfg. Co., Carbondale, Pa.
Full-size Weston testing screen in operation and a high carbon steel plate from a vibrating screen which has handled 80,000 tons of rock and will be used again next season. Also samples of other types of screen plate, floor gratings and stair treads.

Hetherington and Berner, Inc., Indianapolis, Ind.
Exhibited operating model of centrifugal dredge pump and descriptive literature.

Highway Truck Mixer Co., Cleveland, O.
Showed moving pictures of truck mixer in operation and descriptive literature. A truck mixer was exhibited at the yards of the Fisher Lime and Cement Co., the product being used on construction jobs about the city.

Kensington Steel Co., Chicago, Ill.
Exhibited manganese steel castings, crusher parts and concaves, chains, crawler links, dipper teeth, pulverizer parts, car wheels, elevator buckets and a new renewable tooth sprocket wheel.

Jaeger Machine Co., Columbus, O.
Exhibited photos and descriptive literature of Jaeger Trail-or-Truck self-dumping transit mixer.

Leschen, A., and Sons Rope Co., St. Louis, Mo.
Exhibited Hercules Red Strand wire rope in various sizes and types and descriptive literature.

Link-Belt Co., Chicago, Ill.
Showed small operating models of vibrating screen and Shaw classifier, double herringbone gear speed reducer with interior exposed and driven slowly by small electric motor, several sizes and types of conveyor idlers and bucket elevator chain, photos and descriptive literature.

Manganese Steel Forge Co., Philadelphia, Pa.
Display of Rol-man manganese steel screens of various sizes, chute lining and spouts, pins and bushings. Also a complete new line of literature.

Marion Steam Shovel Co., Marion, O.
Exhibited photos of shovels in operation, descriptive bulletins and a jar containing gravel. All producers were given a guess as to the number of pieces of gravel in the jar, the winners receiving handsome prizes.

McLanahan and Stone Machine Co., Hollidaysburg, Pa.
Showed miniature operating model of log washer, one-third size operating model of 21-in. single-roll crusher and two-fifth size model shaker screen. Also descriptive literature.

Morris Machine Works, Baldwinsville, N. Y.
Exhibited operating model on one-eighth scale of 12-in. dredge pump with traveling suction screen and intake. Descriptive literature. Also showed a section of the shell of a dredge pump.

New Jersey Wire Cloth Co., Trenton, N. J.
Displayed samples of sixty special sizes of wire cloth made of manganese and hardened steel in various sizes of mesh and weights of wire in both square and rectangular mesh. Also samples of Roebling steel cable and literature.

Niagara Roller Bearing Screens, Buffalo, N. Y.
Exhibited full-size half-section of a 6-ft. by 8-ft. scalper with 4½-in. openings and a half-section of a 3-ft. by 6-ft. scalper with 2-in. openings, miscellaneous bearings and descriptive literature.

Nordberg Mfg. Co., Milwaukee, Wis.
Exhibited a full-size Symons vibrating screen with photos and descriptive literature of cone crushers and other products.

Northwest Engineering Co., Chicago, Ill.
Exhibited photographic panels showing line of excavating and material handling equipment.

Ohio Power Shovel Co., Lima, O.
Showed photos of Lime 101 shovel, dragline and crane, roller bearing equipped throughout. Also a new line of descriptive literature.

Perfect Classifier Co., Nashville, Tenn.
Miniature operating model of Perfect screw classifier and samples of product. Also photos and blue prints of installations and descriptive literature.

PIT AND QUARRY, Chicago, Ill.
Distributed copies of 1929 Annual Engineering and Review number and perforated notebook miniatures of PIT AND QUARRY.

Plymouth Locomotive Works (Fate-Root-Heath Co.), Plymouth, O.
Displayed photographs of all types and sizes of gasoline and diesel locomotives of from 2½-ton to 60-ton capacity.

Rock Products, Chicago, Ill.
Displayed copies of directory and of current issues of publication.

Ross Screen and Feeder Co., New York City
Exhibited miniature operating models of chain feeder, feeder screen and feeder grizzly with diagrams and descriptive literature.

Sanford Day Iron Works, Knoxville, Tenn.
Exhibited working model of automatic dump-bottom car on track, with photos showing cars in operation and descriptive literature.

Sauerman Bros., Inc., Chicago, Ill.
Distributed a complete line of literature describing sand and gravel handling equipment.

Simplicity Engineering Co., Durand, Mich.
Exhibited operating model of double-deck gyrating screen and descriptive literature.

Smith Engineering Works, Milwaukee, Wis.
Distributed catalogues of sand and gravel plant equipment.

Stephens-Adamson Mfg. Co., Aurora, Ill.
Featured new vibrator screen with lighted photo display and cross-sectional views, also J. F. S. speed reducer, Simplex conveyor idler and miniature operating model of box-car loader.

Stoody Company, Whittier, Calif.
Exhibited complete line of equipment for plant maintenance and repair, including a flexible shaft grinder, machine shop grinder, acetylene welding outfit, and a display of special hard surfacing metal with photos of its various applications to the industry.

Taylor-Wharton Iron and Steel Co., High Bridge, N. J.
Displayed manganese steel elevator and conveyor chain, dipper teeth, pulverizer hammers, elevator buckets, jaw plates, pinions, tractor links, dredge buckets and Timang screen cloth.

Thew Shovel Co., Lorain, O.
Displayed photos and literature of all sizes of shovels from ½-cu. yd. to 1-cu. yd. capacity and a locomotive crane.

Transit Mixers, Inc., San Francisco, Calif.
Displayed photos of Transit Mixer in operation and descriptive literature.

Tyler Co., W. S., Cleveland, O.
Exhibited Type 60 Hum-mer single-deck vibrating screen, heavy duty type, also set of testing sieves, installation photos and catalogues.

Vulcan Iron Works, Wilkes-Barre, Pa.
Distributed complete line of literature on steam and gas locomotives.

Welch, F. M., Engineering Service, Inc., Greenville, O.
F. M. Welch in attendance.

Registration List

Abbott, G. B., International Harvester Company of America, Chicago, Ill.
Adams, R. L., Stoody Company, Whittier, Cal.
Adamson, C. H., Stephens-Adamson Mfg. Co., Aurora, Ill.
Ahearn, V. P., National Sand & Gravel Ass'n., Washington, D. C.
Akers, T. E., State Highway Dept. of Tenn., Nashville, Tenn.
Allen, H. E., Penn-Dixie Cement Corp., Chattanooga, Tenn.
Anderson, C. M., Chamber of Commerce, Memphis, Tenn.
Arnett, A. B., Columbus Gravel Co., Columbus, Miss.
Artz, Fred E., The Marion Steam Shovel Co., Marion, O.
Aulman, Theo., Eagle Iron Works, Des Moines, Ia.
Ault, C. M., The Barnes Sand & Gravel Co., Piketon, O.
Avery, Charles, Charles Avery Road Contractor, Plainfield, Ill.
Avirett, M. D., Georgia Gravel Co., Columbus, Ga.
Ayres, A. O., Eau Claire Sand & Gravel Co., Eau Claire, Wis.
Babcock, Merritt W., Indiana Gravel Co., Indianapolis, Ind.
Bachman, H. L., The Highway Truck Mixer Co., Cleveland, O.
Banner, L. G., Estill Springs Sand & Gravel Co., Estill Springs, Tenn.
Barber, F. D., Simplicity Engineering Co., Durand, Mich.
Barling, H. B., Muskogee Sand & Gravel Corp., Muskogee, Okla.
Barnhart, Henry, Ohio Power Shovel Co., Lima, O.
Barth, F. E., Ohio River Sand and Gravel Co., New Martinsville, W. Va.
Bateman, J. H., Barrow-Agee Laboratories, Inc., Memphis, Tenn.
Battjes, H. R., Grand Rapids Gravel Co., Grand Rapids, Mich.
Bauer, C. C., Kinsington Steel Co., Chicago, Ill.
Baumann, E. W., State Highway Dept. of Tenn., Nashville, Tenn.
Beesley, T. J., Texas Construction Material Co., Houston, Texas.
Behnke, Geo. W., Simplicity Engineering Co., Durand, Mich.
Bell, E. B., Central Sand & Gravel Co., Memphis, Tenn.
Bennett, A. G., Consolidated Sand & Gravel Co., Toronto, Ont.
Bennett, W. H. K., W. H. K. Bennett Co., Chicago, Ill.
Berger, J. Fennell, The New Jersey Wire Cloth Co., Trenton, N. J.
Berner, Robert, Hetherington & Berner, Inc., Indianapolis, Ind.
Biesanz, Charles P., Biesanz Stone Co., Winona, Minn.
Biggs, W. E., Fairbanks, Morse & Co., Louisville, Ky.
Billeter, Frank J., Indiana Gravel Co., Indianapolis, Ind.
Billingsley, Thos. J., Wolf River Sand & Gravel Co., Memphis, Tenn.
Bingham, F. A., Northern Gravel Co., West Bend, Wis.
Birckhead, P. H., Bucyrus-Erie Co., S. Milwaukee, Wis.
Blackburn, D. M., Hendrick Mfg. Co., Carbondale, Pa.
Blackman, J. P., Middlesex Sand & Gravel Co., Cambridge, Mass.
Blakemore, A. L., American Manganese Steel Co., Chicago Heights, Ill.
Blanton, J. B., J. B. Blanton Co., Frankfort, Ky.
Bledsoe, H. L., State Highway Dept. of Tenn., Nashville, Tenn.
Bliss, W. A., Keystone Sand Supply Co., Pittsburgh, Pa.
Bogue, G. G., Davenport Locomotive & Mfg. Corp., Davenport, Ia.
Bohlen, Lee, Central Sand & Gravel Co., Memphis, Tenn.
Bolster, L. J., T. L. Herbert & Sons, Nashville, Tenn.
Bowers, T. M., McClain Sand Co., Point Marion, Pa.
Boynton, E. W., Northern Gravel Co., Muscatine, Ia.
Boynton, E. W., Jr., Northern Gravel Co., Muscatine, Ia.
Breen, Wm. J., Grand Rapids Gravel Co., Grand Rapids, Mich.
Breton, E. J., Page Engineering Co., Chicago, Ill.
Brewster, H. T., Saxet Sand & Gravel Co., Houston, Texas.
Bridgeman, O. A., The Western Paving Co., Oklahoma City, Okla.
Bridwell, W. A., Wolf River Sand & Gravel Co., Memphis, Tenn.
Brister, M. B., Jr., Fairbanks, Morse & Co., Chicago, Ill.
Brooks, R. E., National Equipment Corp., Milwaukee, Wis.
Brown, Edwin C., Good Roads Machinery Co., Kennett Square, Pa.
Brown, J. A., Fairbanks, Morse & Co., St. Louis, Mo.
Brown, W. Jess, Dixie Sand & Gravel Co., Chattanooga, Tenn.
Buckbee, J. C., Northern Gravel Co., West Bend, Wis.
Burke, J. E., The Ready Mixed Concrete Co., Pittsburgh, Pa.
Busch, A. D., The W. S. Tyler Co., Cleveland, O.
Butz, Charles M., The Western Hills Sand & Gravel Co., Cleaves, O.
Buzard, F. T., Fate-Root-Heath Co., Plymouth, O.
Caldwell, H. P., Ohio River Sand Co., Louisville, Ky.
Carr, Bradley S., American Manganese Steel Co., Chicago Heights, Ill.
Carriere, A. W., New York Belting & Pkg. Co., New York, N. Y.
Carson, W. W., Jr., Texas Sand & Gravel Producers, Austin, Texas.
Cash, Frank, U. S. Bureau of Mines, Birmingham, Ala.
Chandler, C. W., Price Sand Co., Tulsa, Okla.
Chandler, J. M., Price Sand Co., Tulsa, Okla.

Christian, C. S., Central Sand & Gravel Co., Memphis, Tenn.
Clark, Sid., W. D. Haden Co., Houston, Texas.
Clouse, H. D., Lincoln Sand & Gravel Co., Lincoln, Ill.
Coffman, H., Hercules Cement Corp., Philadelphia, Pa.
Colby, A. C., Nordberg Mfg. Co., Milwaukee, Wis.
Collins, R. C., Warner Company, Philadelphia, Pa.
Conkling, Frank G., Signal Mountain Portland Cement Co., Chattanooga, Tenn.
Conlin, Herbert L., Herbert L. Conlin, Toronto, Ont.
Conn, H. R., McLain Sand Co., Point Marion, Pa.
Conner, C. N., American Road Builders' Ass'n., Washington, D. C.
Conrades, Otto S., St. Louis Material & Supply Co., St. Louis, Mo.
Cook, Geo. H., Stewart Sand & Material Co., Kansas City, Mo.
Cooper, Geo. H., Simplicity Engineering Co., Durand, Mich.
Cooper, J. S., Memphis Stone & Gravel Co., Memphis, Tenn.
Cooper, W. C., Henderson Sand & Gravel Co., Henderson, Ky.
Cordes, V. A., Wolf River Sand & Gravel Co., Memphis, Tenn.
Cosby, C. Pierson, Southern Sand & Gravel Co., Selma, Ala.
Crawford, H. G., Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Daniels, A. W., American Manganese Steel Co., Chicago, Ill.
Darby, J. A., Saxet Sand & Gravel Co., Houston, Texas.
Darnell, L. P., Cincinnati Rubber Mfg. Co., Cincinnati, O.
Davis, Marvin, Wolf River Sand & Gravel Co., Memphis, Tenn.
Davison, H. M., Harnischfeger Sales Corp., Milwaukee, Wis.
Davison, H. S., J. K. Davison & Bro., Pittsburgh, Pa.
Deister, Irwin F., Deister Machine Co., Ft. Wayne, Ind.
Dickinson, H. L., Benton Gravel Co., Inc., Benton, Ark.
Dickinson, H. L., Cross Co. Gravel Co, Cherry Valley, Ark.
Dickinson, H. L., Newark Sand & Gravel Co., Newark, Ark.
Dickinson, H. L., Bearden Gravel Co., Bearden, Ark.
Dills, W. S., Yahola Sand & Gravel Co., Muskogee, Okla.
Divney, James J., Marion Steam Shovel Co., Marion, O.
Duffy, J. H., Ohio River Sand Co., Louisville, Ky.
Dugan, J. N., Dugan, Cincinnati, O.
Dunn, J. E., Portland Cement Ass'n., Nashville, Tenn.
Dunn, N. C., Arkansas City Sand & Gravel Co., Arkansas City, Ark.
Dunning, Frank, National Bldrs. Supply Ass'n., Cleveland, O.
Du Pius, O. G., Eagle Iron Works, Des Moines, Ia.
Earnshaw, George M., *Rock Products*, Chicago, Ill.
Eastland, Roy P., Texas Sand & Gravel Co., Waco-Amarillo, Texas.
Eberly, R. W., Buffalo Gravel Corp., Buffalo, N. Y.
Evans, Miss Anne, The Choctaw Culvert & Machy. Co. (Thew Shovel Co., distributors), Memphis, Tenn.
Fischer, W. W., Central Sand & Gravel Co., Memphis, Tenn.
Fletcher, R. C., Flint Crushed Gravel Co., Des Moines, Ia.
Follett, W. L., Wolf River Sand & Gravel Co. Memphis, Tenn.
Ford, Lester, Mississippi Valley Contractor, Memphis, Tenn.
Ford, T. B., Jr., The Dorr Co., Atlanta, Ga.
Foster, Alexander, Jr., Warner Company, Philadelphia, Pa.
Foules, J. J., Missouri Portland Cement Co., Memphis, Tenn.
Fowler, Henry P., U. S. Chamber of Commerce, Washington, D. C.
Fowler, Wm. H., The Dravo Contracting Co., Pittsburgh, Pa.
Fraas, Henry C., Jaeger Machine Co., Columbus, O.
Frisbie, D. B., Barber-Greene Co., Aurora, Ill.
Frosch, A. E., Eastern Ohio Sand & Gravel Co., Steubenville, O.
Fry, W. N., Central Sand & Gravel Co., Memphis, Tenn.
Fuller, F. C., The Portsmouth Sand & Gravel Co., Portsmouth, O.
Gaddis, P. G., S. K. F. Industries, Inc., New York, N. Y.
Galbraith, Oliver, Choctaw Culvert & Machinery Co., Memphis, Tenn.
Garber, M. B., The Thew Shovel Co., Lorain, O.
Gemmer, W. H., Texas Construction Material Co., Houston, Texas.
Gerhardt, W. G., A. Leschen & Sons Rope Co., St. Louis, Mo.
Gifford, F. R., Gifford-Hill & Co., Inc., Dallas, Texas.
Goldberg, Abe, Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Grant, C. H., Highway Truck Mixer Co., Cleveland, O.
Gray, C., American Aggregates Corp., Indianapolis, Ind.
Gray, Edward M., Des Moines Sand & Fuel Coop. Ass'n., Des Moines, Ia.
Green, R. S., American Steel & Wire Co., Chicago, Ill.
Green, Raymond, Barber-Greene Co., Aurora, Ill.
Grogg, R. I., Wolf River Sand & Gravel Co., Memphis, Tenn.
Guilfoil, D. D., Sauerman Brothers, Inc., Chicago, Ill.
Grundeman, Ed., Blue Rapids Gravel Co., Blue Rapids, Kans.
Hadden, S. C., Indiana Sand & Gravel Ass'n., Indianapolis, Ind.
Haddow, Hugh, Jr., Menantico Sand & Gravel Co., Millville, N. J.
Haggerty, F. J., General Concrete Products Corp., Warren, Pa.
Hailey, W. L., The Estill Springs Sand & Gravel Co., Nashville, Tenn.
Hall, Fred E., The T. J. Hall Co., Cincinnati, O.
Hall, R. F., West Baden Hotel, West Baden, Ind.
Harbison, J. B., J. B. Harbison Equipment Co., Little Rock, Ark.
Harris, C. F., Columbus Gravel Co., Columbus, Miss.
Harris, I. A., Columbus Gravel Co., Columbus, Miss.
Harris, Jack, Central Sand & Gravel Co., Memphis, Tenn.
Hawkins, C. C., Tenn.-Arkansas Gravel Co., Arkansas City, Ark.
Heinly, "Speck" L. W., Kansas Sand Co., Bonner Springs, Kans.
Heppel, Fred C., Stoody Co., Memphis, Tenn.
Herbert, Thos. L., T. L. Herbert & Sons, Nashville, Tenn.
Hevenor, G. P., Muskogee Sand & Gravel Corp., Muskogee, Okla.
Hill, Edwin F., Jr., Transit Mixers, Inc., San Francisco, Cal.
Hill, J. Rutledge, Gifford-Hill & Co., Inc., Dallas, Texas.
Himmler, M. M., National Sand & Gravel Ass'n., Washington, D. C.
Hobbs, P. M., Manganese Steel Forge Co., Chicago, Ill.
Hodge, Chester J., Hetherington & Berner, Indianapolis, Ind.
Holden, Thomas S., F. W. Dodge Corp., New York, N. Y.
Holland, R. E., Ohio River Sand & Gravel Co., Parkersburg, W. Va.
Holloway, H. H., Holloway Gravel Co., Inc., Amite, La.
Hooper, H. H., Perfect Classifier Co., Nashville, Tenn.
Hornaday, M. G., Hornaday Paving Co., Memphis, Tenn.
Horton, Geo. F., Horton & Horton, Houston, Texas.
Hoskin, A. J., PIT AND QUARRY, Chicago, Ill.
Hovis, O. W., State Highway Dept. of Tenn., Nashville, Tenn.
Howard, J. N., Ohio Power Shovel Co., Lima, O.
Howe, M. E. V., Northwest Engineering Co., New Orleans, La.
Hubbard, D., Chesapeake & Ohio Railway Co., Covington, Ky.
Huntington, C. S., Link-Belt Co., Chicago, Ill.
Hutchins, H. A., Northwest Engineering Co., Chicago, Ill.

Ireland, C. B., Montgomery Gravel Co., Montgomery, Ala.
Jackson, F. F., U. S. Bureau Public Roads, Washington, D. C.
Jacobs, C. A., Builders' Sand & Gravel Co., Chicago, Ill.
Jennings, F. B., The Marion Steam Shovel Co., Birmingham, Ala.
Jensen, J. R., Janesville Sand & Gravel Co., Janesville, Wis.
Jensen, Kenneth, Kensington Steel Co., Chicago, Ill.
Johnson, W. C., Allis-Chalmers Mfg. Co., Atlanta, Ga.
Johnston, Carlton C., Hillsdale Gravel Co., Sweetwater, Tex.
Johnston, V. O., Lincoln Sand & Gravel Co., Lincoln, Ill.
Jones, F. H., The Dorr Co., New York, N. Y.
Jones, Geo. E., Jr., Sanford Day Iron Wks., Inc., Knoxville, Tenn.
Jones, Ralph E., Beloit Sand & Gravel Co., Chicago, Ill.
Jones, Victor H., Smith Engineering Wks., Milwaukee, Wis.
Kelley, R. M., Eastern Rock Products, Inc., Utica, N. Y.
King, J. T., Grand River Gravel Co., Muskogee, Okla.
Kinnaird, W. D., Hetherington & Berner, Inc., Memphis, Tenn.
Knight, Hal G., Rubber City Gravel Co., Akron, O.
Kochtitzky, Oscar, Crow Creek Gravel & Sand Co., Forrest City, Ark.
Kohlmeyer, R., H. J. Miller Lumber Co., Seattle, Wash.
Kraeger, L. H., Western Wheeled Scraper Co., Memphis, Tenn.
Krider, G. E., McLanahan-Stone Machine Co., Hollidaysburg, Pa.
Kuehne, Otto, Jr., Kansas Sand Co., Topeka, Kans.
Laird, C. B., Eagle Iron Works, Des Moines, Ia.
Larsen, V. E., PIT AND QUARRY, Chicago, Ill.
Laun, L. L., Elkhart-Moraine Sand & Gravel Co., Elkhart Lake, Wis.
Laurell, G. D., The Thew Shovel Co., Atlanta, Ga.
Laurell, Geo. D., The Thew Shovel Co., Lorain, O.
Lee, R. E., New Hope Gravel Co., Columbus, Miss.
Leigh, A. C., Dravo Contracting Co., Pittsburgh, Pa.
Lenhart, W. B., *Rock Products*, Chicago, Ill.
Lewis, R. O., Greenville Sand & Gravel Co., Greenville, Miss.
Light, LeRoy B., Sheridan Sand & Gravel Co., Ottawa, Ill.
Lillard, G. L., Harnischfeger Sales Corp., Memphis, Tenn.
Lockwood, R. L., U. S. Department of Commerce, Washington, D. C.
Logan, John G., Manganese Steel Forge Co., Philadelphia, Pa.
Logsdon, R. E., Convention Bureau, Memphis, Tenn.
Lucas, T. F., McClain Sand Co., Point Marion, Pa.
Lyons, Maxwell J., Joe Lyons Machinery Co., Little Rock, Ark.
Maddux, T. W., Brookhaven Gravel Co., Brookhaven, Miss.
Mahoney, A. J., Oklahoma Material Co., Inc., Enid, Okla.
Mahoney, J. H., Jr., Oklahoma Material Co., Inc., Enid, Okla.
Maners, J., Central Sand & Gravel Co., Memphis, Tenn.
Markham, W. C., American Ass'n of State Highway Officials, Washington, D. C.
Marsh, A. Fletcher, Marsh & Truman Lumber Co., Chicago, Ill.
Marvel, T. S., Dravo Contracting Co., Pittsburgh, Pa.
Matthews, L. E., English Bros. Machinery Co., Kansas City, Mo.
McAllister, C. P., Camden Gravel Co., Camden, Tenn.
McCandlish, D. F., Stoody Company, Whittier, Cal.
McChesney, R. L., Miss. Sand & Gravel Ass'n, New Orleans, La.
McCourt, L. T., Central Sand & Gravel Co., Memphis, Tenn.
McCourt, W. E., Greenville Sand & Gravel Co., Greenville, Miss.
McDonald, W. H., Memphis Stone & Gravel Co., Memphis, Tenn.
McGeorge, W. P., Pine Bluff Sand & Gravel Co., Pine Bluff, Ark.
McGinnis, N. C., N. C. McGinnis & Co., Memphis, Tenn.
McGowan, Wayne A., Ideal Sand & Gravel Co., Mason City, Ia.
McGraw, V. G., Columbus Gravel Co., Columbus, Miss.
McGuire, D. D., State Highway Dept. of Tenn., Nashville, Tenn.
McLanahan, J. C., McLanahan Stone Co., Hollidaysburg, Pa.
Meckenstock, J. W., Pettibone Mulliken Co. (W. H. K. Bennett Co.), Chicago, Ill.
Mefford, John A., Estill Springs Sand & Gravel Co., Nashville, Tenn.
Megsnity, B. F., Fairbanks, Morse & Co., Chicago, Ill.
Milkowski, V. J., Morris Machine Works, Baldwinsville, N. Y.
Miller, H. J., H. J. Miller Lumber Co., Seattle, Wash.
Miller, O. H., Choctaw Culvert & Machy. Co., Memphis, Tenn.
Mills, E. E., American Aggregates Corp., Detroit, Mich.
Monk, J. D., Pidgeon Thomas Iron Co., Memphis, Tenn.
Moore, H. W., J. B. Harbison Equip. Co., Little Rock, Ark.
Moore, L. J., The Choctaw Culvert & Machy. Co. (Thew Shovel Co., Distributors), Memphis, Tenn.
Moore, Redington, Taylor Wharton Iron & Steel Co., High Bridge, N. J.
Moran, John D., Central Sand & Gravel Co., Memphis, Tenn.
Mosher, J. S., Bucyrus-Erie Co., S. Milwaukee, Wis.
Mullen, C. F., The Georgia Gravel Co., Columbus, Ga.
Munz, C. A., Eastern Rock Products, Inc., Utica, N. Y.
Myers, Walter, Russellville Sand & Gravel Co., and Scranton Gravel Co., Russellville, Ark.
Nafziger, S. O., O. K. Clutch & Machy. Co., Columbia, Pa.
Nagle, Perry, American Manganese Steel Co., Chicago Heights, Ill.
Near, Ralph G., Sheridan Sand & Gravel Co., Inc., Ottawa, Ill.
Newton, H. W., Stephens-Adamson Mfg. Co., Aurora, Ill.
Nicol, Geo. L., Portland Cement Ass'n., Nashville, Tenn.
Nicol, W. S., Cross Engineering Co., Carbondale, Pa.
Nugent, T. C. L., T. C. L., Nugent, Louisville, Ky.
O'Brien, J. F., Vulcan Iron Works, Wilkes-Barre, Pa.
Ochtman, A. F., The Buda Company, Harvey, Ill.
Olson, G. H., Link-Belt Company, Chicago, Ill.
Onkst, B. E., Harnischfeger Sales Corp., Milwaukee, Wis.
Overton, Watkins, Mayor, City of Memphis, Memphis, Tenn.
Owens, H. V., Eastern Rock Products, Inc., Utica, N. Y.
Ozias, R. L., Stoody Company, Whittier, Cal.
Palm, T. J., Texas Sand & Gravel Co., Waco-Amarillo, Tex.
Parrish, W. H., Jr., Estill Springs Sand and Gravel Co., Nashville, Tenn.
Patton, E. J., Stephens-Adamson Mfg. Co., Aurora, Ill.
Peck, F. W., Peck-Thompson Sand Co., Kansas City, Mo.
Pennel, George E., Stoody Company of Memphis, Memphis, Tenn.
Peters, C. H., The W. S. Tyler Co., Cleveland, O.
Peterson, Arthur W., American Manganese Steel Co., Chicago Heights, Ill.
Peterson, Charles R., Osgood Company, Marion, O.
Peterson, J. W., Central Sand & Gravel Co., Memphis, Tenn.
Phillips, S. A., PIT AND QUARRY, Chicago, Ill.
Podlesak, G. F., Fairbanks, Morse & Co., Chicago, Ill.
Pohlkotte, M. C., Allen Cone & Machinery Corp., New York, N. Y.
Popplewell, T. E., Ft. Worth Sand & Gravel Co., Ft. Worth, Texas.

Potter, W. H., Manganese Steel Forge Co., Philadelphia, Pa.
Potts, Robert J., Potts-Moore Gravel Co., Waco, Texas.
Prince, John, Stewart Sand Company, Kansas City, Mo.
Proudley, C. E., National Sand & Gravel Ass'n., Washington, D. C.
Puckett, E. L., Amory Sand & Gravel Co., Amory, Miss.
Putnam, E. R., The Putnam Sand Co., Salina, Kans.
Puryear, S. R., The Perfect Classifier Co., Nashville, Tenn.
Quigley, R. M., Ft. Worth Sand & Gravel Co., Ft. Worth, Texas.
Raicke, P. A., Harnischfeger Sales Corp., Memphis, Tenn.
Ray, C. V., Coon River Sand Co., Des Moines, Ia.
Ray, Dudley, State Highway Dept. of Tenn., Nashville, Tenn.
Reed, H. F., Sauerman Brothers, Inc., Chicago, Ill.
Reed, John W., Cincinnati Rubber Mfg. Co., Cincinnati, O.
Reel, L. E., Gifford-Hill Co., Inc., Forest Hill, La.
Reinke, F. J., St. Louis Material & Supply Co., St. Louis, Mo.
Remick, W. L., Hydrotator Company, Hazelton, Pa.
Richards, W. B., Florida Gravel Co., Chattahoochee, Fla.
Richmond, Geo. B., Huntington, W. Va.
Richmond, J. L., Union Sand & Gravel Co., Huntington, W. Va.
Riley, Jos. G., Blaw-Knox Company, Pittsburgh, Pa.
Robbins, W. C., Amory Sand & Gravel Co., Amory, Miss.
Roberts, B. J., Deister Machine Co., Fort Wayne, Ind.
Robie, T. M., Fairbanks, Morse & Co., Chicago, Ill.
Robson, E. S., Ludlow-Saylor Wire Co., St. Louis, Mo.
Rockwood, Nathan C., *Rock Products*, Chicago, Ill.
Rodgers, Phil K., McCrady-Rodgers Co., Pittsburgh, Pa.
Rogers, W. E., Arkansas River Sand Co., Tulsa, Okla.
Ross, William, Ross Screen & Feeder Co., New York, N. Y.
Ruddy, T. A., Stephens-Adamson Mfg. Co., Aurora, Ill.
Runkle, K. H., General Electric Co., Schenectady, N. Y.
Ryberg, Eric, Utah Sand and Gravel Products Corp., Salt Lake City, Utah.
Ryder, H. C., The Hayward Co., New York, N. Y.
Salchenberger, F. S., Morris Machine Works, Chicago, Ill.
Sankey, John, Joliet Gravel Co., Springfield, Ill.
Savage, D. G., The Thew Shovel Co., Atlanta, Ga.
Savage, Dow G., The Thew Shovel Co. and Universal Crane Co., Atlanta, Ga.
Schade, R. M., Allis-Chalmers Mfg. Co., St. Louis, Mo.
Schaeffer, A. J., Niagara Roller Bearing Screen Co. and Niagara Concrete Mixer Co., Buffalo, N. Y.
Schifflin, A. K., Link-Belt Company, Chicago, Ill.
Schneider, Geo. H., Bellevue Sand & Gravel Co., Bellevue, Ia.
Schufreider, J. N., Sauerman Brothers, Inc., Chicago, Ill.
Seale, J. E., A. Leschen & Sons Rope Co., St. Louis, Mo.
Shackelsworth, C. G., Lawson Sand & Material Co., Kansas City, Mo.
Sherman, L. B., Ryan Manufacturing Corp., Chicago, Ill.
Shiely, J. L., J. L. Shiely Company, St. Paul, Minn.
Shores, Geo. W., Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Shotton, B. G., Hendrick Manufacturing Co., Carbondale, Pa.
Shugg, L. W., General Electric Co., Schenectady, N. Y.
Silva, Clarence E., The Marion Steam Shovel Co., Marion, O.
Smith, Charles A., Capt. Charles A. Smith, Oil City, Pa.
Smith, Douglas, Central Sand & Gravel Co., Memphis, Tenn.
Smith, Harold T., Seaboard Sand & Gravel Corp., New York, N. Y.
Smith, Miles, Stoody Company, Whittier, Cal.
Smith, R. D., Memphis Stone & Gravel Co., Memphis, Tenn.
Smith, W. L., Memphis Stone & Gravel Co., Memphis, Tenn.
Snyder, A., Louisville, Ky.
Sparkman, D. M., Signal Mountain Portland Cement Co., Chattanooga, Tenn.
Steinbrenner, H. P., Ohio Power Shovel Co., Chicago, Ill.
Steinhauer, C. C., New Jersey Wire Cloth Co., Trenton, N. J.
Stelley, H. A., Buffalo Gravel Corp., Buffalo, N. Y.
Stepanian, S., The Arrow Sand & Gravel Co., Columbus, O.
Stevenson, J. McAllister, Hillsdale Gravel Co., Sweetwater, Texas.
Stewart, H. H., J. K. Davison & Brother, Pittsburgh, Pa.
Stitt, Samuel S., Henderson Sand & Gravel Co., Henderson, Ky.
Stone, Ben, Merom Gravel Co., Indianapolis, Ind.
Street, Harold P., Street Bros. Machine Works, Chattanooga, Tenn.
Strube, H. L., Link-Belt Company, Philadelphia, Pa.
Sullivan, Ralph C., Rock Products, Chicago, Ill.
Swasey, A. M., Highway Truck Mixer Co., Cleveland, O.
Swift, A. C., Moundsville Sand Co., Moundsville, W. Va.
Taylor, W. F., Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Thoenen, J. R., U. S. Bureau of Mines, Washington, D. C.
Thomas, C. E., Ideal Sand & Gravel Co., Mason City, Ia.
Tompkins, A. A., Central Sand & Gravel Co., Riverside Park, Memphis, Tenn.
Thomson, H. F., General Material Co., St. Louis, Mo.
Townsend, T. W., Kolola Gravel Co., Columbus, Miss.
Trainor, J. A., Taylor Wharton Iron & Steel Co., High Bridge, N. J.
Trauffer, W. E., PIT AND QUARRY, Chicago, Ill.
Verhey, P., Harnischfeger Corp., Memphis, Tenn.
Wagoner, J. H., Eastern Rock Products, Inc., Utica, N. Y.
Waite, G. W., Koenig Coal & Supply Co., Detroit, Mich.
Walker, Stanton, National Sand & Gravel Ass'n., Washington, D. C.
Walton, H. R., Harnischfeger Sales Corp., Milwaukee, Wis.
Wansley, W. A., W. D. Haden Co., Galveston, Texas.
Warren, Ray V., Western Pa. Sand & Gravel Ass'n., Pittsburgh, Pa.
Watrous, C. B., Nordberg Manufacturing Co., Milwaukee, Wis.
Watters, R. M., Watters & McCarry, Columbus, Miss.
Webster, Ed., Ross Screen & Feeder Co., New York, N. Y.
Weigel, W. M., Missouri-Pacific Railroad Co., St. Louis, Mo.
Weimer, Hugo W., Hugo W. Weimer, Milwaukee, Wis.
Welch, F. M., American Aggregates Corp. (F. M. Welch Engineering Service), Greenville, O.
West, H. E., The West Sand Co., Muskogee, Okla.
Weston, Harold B., Weston Sand & Gravel Co., Logtown, Miss.
Wheeler, W. H., Washington University, St. Louis, Mo.
Wheeler, V. L., The Thew Shovel Co., Dallas, Texas.
Whyte, J. A., Gifford-Hill & Co., Inc., Dallas and Texarkana, Tex.
Wickett, H. A., Herbert L. Conlin, Toronto, Ont.
Wigton, Paul, Traylor Vibrator Co., Denver, Colo.
Wilkie, E. J., Bucyrus-Erie Co., S. Milwaukee, Wis.
Willey, S. E., Willey-Ruckstuhl Co., Cincinnati, O.
Williamson, G. E., Tulsa Sand Co., Tulsa, Okla.
Wills, Roy K., The Ohio Power Shovel Co., Lima, O.
Wilson, Lloyd, C. O. Bartlett & Snow Co., Cleveland, O.
Wilson, R. H., The Thew Shovel Co., Lorain, O.
Winkler, E. B., Lawson Sand & Material Co., Kansas City, Mo.
Wise, W. F., National Crushed Stone Ass'n., Dallas, Texas.
Wood, F. G., Whitney Materials Co., Duluth, Minn.
Wood, Jim, Central Sand & Gravel Co., Memphis, Tenn.
Wyse, F. O., Bucyrus-Erie Co., S. Milwaukee, Wis.
Yager, P. A., River Sand & Gravel Co., Owensboro, Ky.
Yon, Charles, Iron City Sand & Gravel Co., Pittsburgh, Pa.
Young, Clark M., Cincinnati Rubber Mfg. Co., Cincinnati, O.

Ladies

Battjes, Mrs. H. R., Grand Rapids, Mich.
Bennett, Mrs. A. G., Toronto, Ont.
Bliss, Mrs. N. A., Pittsburgh, Pa.
Cooper, Mrs. J. S., Memphis, Tenn.
Cooper, Mrs. W. C., Henderson, Ky.
Cordes, Mrs. V. A., Memphis, Tenn.
Filler, Mrs. H. C., Urbana, Texas.
Fletcher, Mrs. Rand C., Des Moines, Ia.
Foules, Mrs. Jack, Memphis, Tenn.
Fowler, Mrs. Wm. H., Pittsburgh, Pa.
Frosch, Mrs. A. E., E. Liverpool, O.
Fuller, Mrs. F. C., Portsmouth, O.
Gamewell, Mrs. W. E., Memphis, Tenn.
Hayley, Mrs. Hugh S., Memphis, Tenn.
Heinly, Mrs. L. W., Bonner Springs, Kans.
Holloway, Mrs. H. H., Amite, La.
Howe, Mrs. M. E. V., Nola, La.
Jones, Mrs. George E., Jr., Knoxville, Tenn.
Kuehne, Mrs. Otto, Jr., Topeka, Kans.
MacDonald, Mrs. W. H., Memphis, Tenn.
McCourt, Mrs. L. T., Memphis, Tenn.
McGowan, Mrs. Wayne A., Mason City, Ia.
Mills, Mrs. E. E., Detroit, Mich.
Mullen, Mrs. C. F., Cleveland, O.
Peck, Mrs. Frank W., Kansas City, Mo.
Peck, Mrs. F. W., Kansas City, Mo.
Phillips, Mrs. S. A., Chicago, Ill.
Potts, Mrs. Robert J., Waco, Texas.
Remick, Mrs. W. L., Hazleton, Pa.
Richmond, Mrs. J. L., Huntington, W. Va.
Rogers, Mrs. W. E., Tulsa, Okla.
Ryberg, Mrs. Eric, Salt Lake City, Utah.
Schneider, Mrs. Geo. H., Clinton, Ia.
Sculley, Mrs. C. F., St. Paul, Minn.
Shiely, Mrs. J. L., St. Paul, Minn.
Smith, Mrs. Miles, Whittier, Cal.
Smith, Mrs. Scott, Mason City, Ia.
Smith, Mrs. Walter Lane, Memphis, Tenn.
Snyder, Mrs. A., Louisa, Ky.
Stepanian, Mrs. Stephen, Columbus, O.
Stone, Mrs. Ben, Indianapolis, Ind.
Trauffer, Mrs. W. E., Chicago, Ill.

Sand-Lime Brick Association Holds Annual Convention

The 26th annual convention of the Sand-Lime Brick Association was held February 3 to 6, at Hotel Pennsylvania, New York. The first two days were occupied largely with meetings of the association's committees and with registration. One meeting was with Committee C-3 of the American Society for Testing Materials.

The first session was held Tuesday afternoon, February 4, and covered the address of President Allen G. Walton, of Philadelphia, Pa.; the report of Secretary Ellen Knight, of Saginaw, Mich.; communications; the report of Treasurer J. Finkbeiner, of Detroit, Mich.; reports of several committees; and the following addresses:

"The Absorption and Strength of Commercial Sand-Lime Brick"—J. A. Murray, Bureau of Standards, Washington, D. C.

"What Architects Do Not Know About Sand-Lime Brick"—Kenneth K. Stowell, associate editor, *Architectural Forum,* New York, N. Y.

"Handling Bulk Lime by Suction"—H. J. Levine, National Brick Corporation, Long Island City, N. Y.

"New York State Lien Law"—W. K. Squier, The Paragon Plaster Co., Syracuse, N. Y.

"Removing Scale from Car Tops by Sand Blast"—W. A. Smyth, York Sandstone Brick Co., Ltd., Toronto, Can.

"The Use of Testing Machines to Control the Quality of Brick"—John R. Kauffman, Crume Brick Co., Dayton, Ohio.

The Wednesday forenoon program was as follows:

"History and Study of Masonry Opening Sizes Committee"—P. H. H. Dunn, Secretary of Committee and Representative of Division of Simplified Practice, Bureau of Standards, Washington, D. C.

"Gypsum Products, Old and New"—J. M. Porter, research engineer, Structural Gypsum Corporation, Linden, N. J.

"Possibilities of Sand-Lime Brick"—G. G. Heghinian, consulting engineer, Baltimore, Md.

"Mortars and Masonry"—C. E. Ellsworth, chief engineer, Construction Division, National Lime Association, Washington, D. C.

"Improvements in Sand-Lime Brick Machinery"—E. D. Church, Jackson and Church Co., Saginaw, Mich.

"Brick Engineering"—T. C. Taylor, president, Sand-Lime Products Co., Detroit, Mich.

"Veneering of Sand-Lime Brick"—R. B. Stuckey, W. A. Riddell Company, Bucyrus, Ohio.

The afternoon session had the following program:

"The Michigan Sand-Lime Brick Association"—W. W. Dohany, secretary, Detroit, Mich.

"Activities of the Bureau of Standards of Interest to Sand-Lime Brick Producers"—J. A. Murray, Bureau of Standards, Washington, D. C.

"Activities of Committee C-3 on Brick, A. S. T. M."—W. H. Crume, Crume Brick Co., Dayton. Ohio.

"City Building Codes"—J. Morley Zander, Saginaw Brick Co., Saginaw, Mich.

"Gauging the Severity of Building Fires"—S. H. Ingberg, Fire Resistance Section, Bureau of Standards, Washington, D. C.

"The Rod Mill and Its Functions in the Manufacture of Sand-Lime Brick"—W. H. Withington, Hardinge Company, Inc., York, Pa.

At the forenoon session on Thursday, John L. Jackson of Saginaw, Mich., gave recommendations for handling publicity and advertising. This was followed by a round-table discussion among members only, and the session concluded with the induction of the new officers for 1930. Thursday afternoon was devoted to visits to the plants of the National Brick Corporation at Long Island City, and the Paramount Brick Works at Brooklyn.

MEN OF THE INDUSTRY

The portrait printed on this page in each number of PIT AND QUARRY is selected without significance as to current events or the position of the individual in the industry.

W. W. Fischer

President, Central Sand and Gravel Company,
Memphis, Tenn.

PERSONAL MENTION

Henry Maag, well known engineer who has been with the H. K. Ferguson Co., of Cleveland, O., for ten years, has been appointed manager of that company's newly established branch office at 520 N. Michigan Blvd., Chicago.

W. J. Parker, commissioner of the Feldspar Grinders' Institute, will read a paper at the 32d annual meeting of the American Ceramic Society to be held at the Royal York Hotel, Toronto, Ont., Feb. 16.

Max E. Landry has been appointed to represent Foote Bros. Gear & Machine Co., of Chicago, for the northern half of the State of Oklahoma, with headquarters at 202 Local Bldg., Oklahoma City.

J. D. Sargent, of Mount Airy, N. C., operator of granite quarries that are reputed the largest in the United States, has been elected president of the National Building Granite Quarries Assn. **M. L. Button**, of Stonington, Maine, was elected vice-president, and **Harris H. Sherman**, of Boston, Mass., was made executive secretary of the same association.

S. O. Nafziger has been placed in charge of a new office at 53 W. Jackson Blvd., Chicago, opened by the O. K. Clutch and Machinery Co., of Columbia, Pa. He is in position to assist patrons in selecting correct equipment in hoisting machinery and compressors.

E. E. LeVan has been appointed general sales manager of the Haynes Stellite Co. of New York, N. Y. The directors have also made the following appointments: **J. H. Maguire**, works manager; **F. T. McCurdy**, plant superintendent; **J. R. Brown**, **F. L. Secord**, and **Everett Page**, assistants to superintendent; and **L. H. Brown**, research engineer.

James Cleary has been appointed general sales manager of Combustion Engineering Corporation, New York. He joined the organization in 1921 and has served successively as district manager at Philadelphia and Detroit, assistant general sales manager, and western manager with offices at Chicago.

Ralph Leavenworth has been appointed assistant general sales manager of The Austin Co., of Cleveland, O. He will have contact with activities at the branch offices throughout the country. He has recently been account executive for this company.

Ralph Leavenworth

H. W. Gillett, recognized authority and writer on alloy steels, and director of Batelle Memorial Institute, Columbia, O., addressed the Pittsburgh section of the American Chemical Society at a dinner meeting, Jan. 16, in the University Club, Pittsburgh, Pa.

George J. Fertig has been appointed director of research for the Pittsburgh Testing Laboratory of Pittsburgh, Pa., in its chemical and physical laboratories at Birmingham, Ala.

Sewell L. Avery, president of the United States Gypsum Co., Chicago, has been elected a director of the Continental Illinois Bank and Trust Co., Chicago.

Fred P. Helming, 67 West Street, Bristol, Conn., has been awarded the sale franchise for LaFrance-Republic trucks, according to announcement by F. D. Soper, vice-president of the La France-Republic Sales Corporation, Alma, Mich.

Benjamin O'Shea, formerly president of the Union Carbide Co., has been made chairman of the board of directors of this company and of the Electro Metallurgical Co.

J. H. Lendi, electrical engineer for the Universal Atlas Cement Co., died at his home in Chicago, Jan. 18, 1930, after an illness for more than a year. He was born in Dubuque, Iowa, in 1874 and graduated from Rose Polytechnic Institute in 1897. He had held his position with the cement company since 1910. The burial was at Terre Haute, Ind.

Benjamin Mortimer Hall, of the firm of B. M. Hall & Sons, civil and mining engineers, Atlanta, Ga., died November 19, 1929. Mr. Hall spent more than 50 years in the active practice of his profession. He was born, 1853, in Fairfield County, S. C. Graduating from the University of Georgia in 1876 with the degree of bachelor of engineering, he received from his alma mater the degree of civil and mining engineer in 1885, and the honorary degree of doctor of science in 1921.

His professional work was largely with mines, quarries and hydraulic problems. After graduation he was professor of mathematics at North Georgia Agricultural College.

Later he was engineer for several Georgia mining and quarrying companies. For several years previous to 1903, he was consulting engineer, U. S. Geological Survey. He served with distinction as supervising engineer, U. S. Reclamation Service, in charge of Texas, New Mexico and Oklahoma from 1904 to 1907; was chief engineer of the Porto Rico Irrigation Service from 1907 to 1910; and was general manager, Amicalola Marble Company in Georgia from 1910 to 1912, since which date he has devoted himself to private practice in Georgia and surrounding states.

He was the author of several papers and bulletins on hydraulic subjects for state and federal governments; was a member of many important arbitration boards and served as chairman of the water power committee of the National Conservation Congress in 1916.

Benjamin M. Hall

FINANCIAL NEWS
CORPORATE & BUSINESS

The information contained in these financial pages is given with the understanding that any statement on the part of this magazine or any of its staff, as to the responsibility or standing of any person, firm or corporation, or as to the value of any property or securities is a mere expression of opinion, given as a matter of service to the readers of PIT AND QUARRY, *for which no responsibility in any way is to attach to this magazine or to any of its staff.*

Consumers Material Corporation's Position

The Consumers Material Corporation of Kansas City has, for some time, been in straightened circumstances, and while solvent, still is without ready cash or readily convertible assets sufficient to pay the claims of their creditors. However, in a letter to these unsecured creditors, the company has just announced that arrangements have been concluded which will effect payment of all the unsecured creditors in full within the ensuing year.

The smaller claims will probably be satisfied immediately, with dividend payments on account to the larger creditors on equal pro rata basis, as funds available.

In order to bring this about, the company has, after considering all phases of the situation, and after unsuccessful attempts at various suggested solutions and methods of refinancing, now concluded negotiations for the leasing of substantially all its tangible properties to the Stewert Sand and Material Company of Kansas City, Missouri, for operation by that company for a period of five years, subjected to unrestricted right of either party to terminate the lease at the end of any year after two years. The Consumers Material Corporation will receive 60 per cent of the net profits of operations at the close of each year as rental of the properties. The company reserves the right to withdraw and sell inventory now on hand for the purpose of applying the proceeds to payment of creditors.

Among the chief features contributing to the present financial condition of the Consumers Material Corporation has been the lack of adequate working capital. Since April, 1929, the company has been forced to sell approximately $500,000 of its accounts receivable at a discount of 10 per cent to provide necessary funds for operations. This has of course cut greatly into earnings. The Stewert Sand and Material Company is amply financed with a successful history of earnings for many years under its present management. This management will now become the management operating the properties of Consumers Material Corporation, and the Stewert Company is prepared to provide adequate working capital and also funds for capital expenditures as may be required to preserve the properties as an economically profitable working whole.

As a component part of the transaction with Stewert Sand Company a new contract has been concluded with the Missouri State Highway Commission on more favorable terms, especially as to sinking fund payments applicable on the company's equipment indebtedness to the state. This indebtedness originally in the sum of $250,000 has been reduced to approximately $52,000 and is repayable at the rate of ten cents on coarse aggregate sold to the State Highway Commission. The new contract provides for the purchase by the State from the Consumers Material Corporation (or the Stewert Sand Company as lessee during the continuance of the lease) of all the Highway Commission's paving requirements in eighteen counties comprising the Kansas City territory in Northwestern Missouri, on a satisfactory price basis. In addition to the requirements of the State to be filled under this contract, the prospects for a large consumption elsewhere of commercial crushed stone are excellent. Jackson County, Missouri, is just entering upon an intensive county road building program for which six and one-half million dollars in bonds were voted in May, 1928.

As an essential element of the lease arrangement, the consent of the respective Bondholders Protective Committees to the lease transaction was obtained and an agreement to subordinate the lien of the bonds to the lease to the extent that any foreclosure would be subject thereto so that the operations of the properties by the Stewert Sand and Material Company would not be disturbed. By virtue of this arrangement, if operation under the lease continues as contemplated, with the rentals available to unsecured creditors, the practical effect is to place the unsecured creditors in actual priority to the bondholders. There is little likelihood that foreclosure will take place so long as operation under the lease is successful.

To insure the success of this agreement it is most important that the general creditors agree to the plan, and bind themselves to forego any individual action of any sort against the company, or any attempt to dis-

CURRENT DIVIDENDS

COMPANY	CLASS OF STOCK	DIVIDEND RATE	HOLDERS OF RECORD	PAYABLE
Alpha Portland Cement	Preferred	1¾% qr.	Mar. 1	Mar. 15
American Brick Co	Preferred	$.50 qr.	Jan. 25	Feb. 1
Bessemer Limestone & Cement	Class A	$.75 qr.	Jan. 20	Feb. 1
Canada Paving and Supply	1st Pfd.	1¾% qr.	Feb. 15	Mar. 1
Cleveland Stone Quarries	Common	$.75 qr.	Feb. 15	Mar. 1
Consolidated Sand and Gravel	Preferred	1¾% qr.	Jan. 31	Feb. 15
Construction Materials	Preferred	$.87½ qr.	Jan. 19	Feb. 1
Consumers Co	Preferred	$3.50 S.	Feb. 10	Feb. 20
Consumers Co	Pr. Pfd.	$1.50 qr.	Mar. 15	Apr. 1
General Asphalt	Preferred	1¼% qr.	Feb. 15	Mar. 1
General Asphalt	Common	$1.00 qr.	Feb. 28	Mar. 15
General Refractories	Common	$.75 qr.	Feb. 12	Feb. 26
Indiana Limestone	Preferred	1¾% qr.	Feb. 20	Mar. 1
Kentucky Consolidated Stone	Preferred	1¾% qr.	Jan. 15	Feb. 1
Kentucky Rock Asphalt	Preferred	1¾% qr.	Feb. 15	Mar. 3
Lehigh Portland Cement	Common	$.62½ qr.	Jan. 14	Feb. 1
Material Service Corp	.....	$.50 qr.	Feb. 15	Mar. 1
Metropolitan Paving Brick	Common	$.50 qr.	Feb. 15	Mar. 1
Missouri Portland Cement	.....	$.50 qr.	Jan. 19	Feb. 1
Pacific Clay Products	.....	$.60 qr.	Jan. 20	Feb. 1
Riverside Cement Co	1st Pfd.	$1.50 qr.	Jan. 15	Feb. 1
Riverside Cement	Class A	$.31¼ qr.	Jan. 15	Feb. 1
Raymond Concrete Pile	Preferred	$.75 qr.	Jan. 20	Feb. 1
Raymond Concrete Pile	Common	$1.00 qr.	Jan. 20	Feb. 1
Standard Paving & Materials, Ltd	Preferred	1¾% qr.	Feb. 2	Feb. 15
Standard Paving & Materials, Ltd	Common	$.50 qr.	Feb. 2	Feb. 15
Superior Portland Cement	Class A	$.27½ M	Feb. 23	Mar. 1
Virginia Carolina Chemical	Pr. Pfd.	1¾% qr.	Feb. 17	Mar. 1
Wolverine Portland Cement	.....	$.15 qr.	Feb. 5	Feb. 15
Worcester Salt Co	Preferred	1¼% qr.	Feb. 10	Feb. 15

turb the operation under the lease, and to be on the basis of pro-rata payments on an equality basis to the larger unsecured creditors as the funds are available.

A condensed balance sheet of the company as of December 31, 1929, slightly adjusted to date is shown below.

ASSETS

PROPERTY		
Land, Plants, Machinery and Equipment	$1,431,937.58	
Office Furniture and Fixtures	6,384.70	
TOTAL	$1,438,322.28	
Less Reserve for Depreciation	338,968.55	
NET PROPERTY		$1,099,353.73
CURRENT ASSETS		
Cash	$ 937.22	
Accounts Receivable	12,340.19	
State Highway Department Freight Account	30,112.85	
Inventories:		
Crushed Stone	81,231.78	
Supplies	2,706.78	
TOTAL CURRENT ASSETS		127,328.82
PREPAID ACCOUNTS		
Prepaid Insurance	3,766.38	
Prepaid Royalties	2,384.25	
Prepaid Surety Bonds	300.00	
Cash With Trustee for Bond Tax	283.21	
Advanced Stripping	87,098.76	
TOTAL PREPAID ACCOUNTS		93,832.60
TOTAL		$1,320,515.15

LIABILITIES

CAPITAL STOCK		
Preferred Stock: 9075 Shares of $100.00 Par Value.		
Common Stock: 9558 Shares—No Par Value.		
TOTAL CAPITAL VALUE		$ 468,877.40
FIRST MORTGAGE BONDS		497,500.00
SECOND MORTGAGE NOTES		78,710.00
REAL ESTATE MORTGAGES		3,922.74
CURRENT LIABILITIES		
Notes Payable (Held by Bondholders' Protective Committee)	$ 50,000.00	
Notes Payable—Equipment	8,845.27	
Accounts Payable	93,936.29	
Accrued Pay Rolls	3,053.38	
Accrued Royalties	9,245.87	
Accrued Taxes	287.31	
TOTAL CURRENT LIABILITIES		165,368.12
CONTRACTURAL LIABILITY STATE HIGHWAY DEPARTMENT		51,555.13
ACCRUED INTEREST FIRST AND SECOND MORTGAGES		51,581.76
RESERVE FOR PERSONAL INJURIES		3,000.00
TOTAL		$1,320,515.15

U. S. Gypsum Plans Stock Increase

Stockholders of the United States Gypsum Company at the meeting February 13 will be asked to approve an increase in the authorized common capitalization from 1,250,000 shares of $20 par stock to 3,000,000 shares. There will be no change in the preferred stock of which 100,000 shares of $100 par stock is authorized.

So far as can be learned, none of the additional is to be issued immediately and the reason given for the proposed increase in the authorized capitalization is that the supply of unissued stock is about exhausted. It has been the policy of the company for some time to have a substantial amount of common stock in the treasury for expansion purposes or for the payment of stock dividends.

It is understood, however, from well-informed sources that the company is not explaining the acquisition of any properties at this time. The last change in the common authorization was on February 9, 1926, when the issue was increased to $25,000,000 of $20 par stock from $15,000,000.

Wolverine Portland Earnings Increased

Net income of the Wolverine Portland Cement Company for the year ended December 31, 1929, amounted to $81,809, after all charges, including federal taxes. This is equal to 81 cents a share on the 100,000 shares of $10 par capital stock outstanding and compares with $51,031 or 51 cents a share earned in the preceding year. Net sales for 1929 were $841,781 as against $881,446 in 1928.

The balance sheet, as of December 31 last, showed current assets of $658,229 and current liabilities of $35,157 as compared with $690,495 and $33,966, respectively, at the end of 1928. Surplus, last December 31, totaled $198,115 in comparison with $174,832 a year earlier.

A comparison of the income account follows:

Years ended Dec. 31,	1929	1928
Net sales	$841,781	$881,466
Gross profit	143,993	132,180
Operating income	80,052	48,409
Other income	11,930	9,451
Total income	91,982	57,860
Federal tax	10,173	6,830
Net income	81,809	51,030

International Cement Net Will Show Up Well

Although the past year must be considered an unsatisfactory one for cement companies in general, still International Cement Corporation will report only a slight decrease in profits from the banner year of 1928. Net earnings for the year 1929 will amount to nearly $5,000,000, and will be equal to better than $7.50 a share on the 619,031 shares of common stock outstanding. This will compare with $5,149,000 or $7.90 a common share in 1928 and $6.90 a share reported in 1927.

While 1929 operations resulted in a slight break in the trend of earnings, which have been steadily upward for the past six years, the slight decrease shows that the corporation was only to a small degree affected by price cutting which made competition the severest reported in the industry in many years. A series of price reductions along the Eastern seaboard was brought about by the continued importation of Belgian cement.

International Cement has a total of thirteen mills so well distributed geographically in this country and in Cubt and Uruguay that only three of them have been materially affected by the price reductions. These mills are the Norfolk mill, which was closed down in August, and two located in New York and Pennsylvania.

The appropriation of millions of dollars by federal and state agencies for road construction and other building activities indicates that International will be able to at least maintain its present rate of earnings this year.

With earnings running at nearly twice common dividend requirements of $4 annually, it is reasonable to expect that shareholders may this year receive some additional distribution.

From its formation in 1919 the company went through an expansion period of some eight years which increased plant capacity about four times to a total of approximately 20,000,000 barrels. A substantial portion of earnings have been employed in this program and at the same time the strong financial position of the company has been maintained.

Income and Profits of Riverside Cement

Riverside Cement Company for the year 1929 showed profits before depreciation, depletion and Federal taxes of $1,519,817.97 and after those charges the net earnings amounted to $1,013,084.97, according to the annual report recently issued by John Treanor, president. After dividends on the first preferred and Class "A" participating stocks, $127,141.48 was used to purchase first preferred stock for retirement, leaving a balance of $212,584.97 credited to surplus.

Total net assets as of December 31, last, were $12,645,097.60, which is equal to approximately $189.16 per share of the first preferred stock. Current assets of $3,520,285.99 were more than seven times current liabilities of $455,141.66.

The report pointed out that in spite of the reduction in business available to local companies through the importation of foreign cement in large quantities, the earnings of the company have been well maintained and in view of important reductions in operating cost and the expected increase in the use of cement, prospects for 1930 are most encouraging.

Stone Merger Includes Six Midwest Companies

Consolidation of the Western Limestone Products Company of Omaha with five other limestone products organizations of the middle west under the name of the Calcium Carbonate Corporation, incorporated under Delaware laws, was announced today by H. E. Schellberg, president of the Omaha company.

Companies included in the merger are the Independent Gravel Company of Hannibal and Joplin, Mo.; the Carthage Crushed Limestone Company of Carthage, Mo.; the Peerless White Lime Company of St. Genevieve, Mo.; the Reliance Whiting Company of Alton, Ill., and the Black White Limestone Company of Quincy, Ill. B. D. Reynolds, Joplin, Mo., is president.

Three Michigan Companies Merge Interests

Merger of three Michigan sand companies, including the West Michigan Sand and Fuel Company of Muskegon, the Manistee Sand and Dock Company of Manistee, and the Port Crescent Sand and Fuel Company of Port Crescent into a new corporation with a capital of more than $2,000,000 was recently announced.

The new company will be known as the Sand Products Corporation and will have its main offices in Detroit. Articles of association have been filed with the secretary of state at Lansing providing for an authorized capital of 15,000 shares of no par value common stock and $1,500,000 in preferred stock.

Of the total, 5,000 shares of no par stock have been issued in exchange for stock of the three companies which have properties valued in excess of $1,000,000. Officers of the new company are: President, Max B. McKee of Detroit; vice-presidents, Mark T. McKee of Detroit; and A. R. Merrick of Saginaw; secretary, C. F. Nugent of Muskegon, and treasurer, A. N. Farmer of Cleveland. J. L. Sensibar of Chicago, and Fritz L. Meeske of Muskegon complete the board of directors.

The purpose of the merger is to effect operating economies in better co-ordinated operation on Lakes Michigan and Huron. Port Crescent is on Lake Huron in the thumb district and Manistee and Muskegon are centrally located on the east shore of Lake Michigan.

Transportation of pig iron, coal or some other bulk product into Muskegon so that freighters may carry loads both ways is now being considered by the company and an operation has been taken on a Muskegon Lake dock with a frontage of about 400 feet, but a commercial dock may be built.

Western Limestone Merger

Consolidation of the Western Limestone Products Company of Omaha with five other limestone products organizations of the middle west under the name of the Calcium Carbonate Corporation, incorporated under the laws of Delaware, has just been announced by H. E. Schellberg, president of the Omaha company.

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Petoskey Portland Elects Officers and Directors

Stockholders of the Petoskey Portland Cement company, Petoskey, Mich., held a harmonious annual meeting Jan. 17 at the offices of the company with 141,277 shares out of 199,075 outstanding being represented in person or by proxy. The principal business transacted was the re-election of J. B. John, J. C. Buckbee and H. H. Lucas as directors for a term of five years each.

A financial balance sheet prepared by Ernst & Ernst, was presented to the stockholders, an analysis disclosing that the book value of the stock as reflected by the statement to be approximately $13.50 per share, the par value being $10 per share.

Profits for the year ended December 31, 1929, after due allowances for depreciation and other charges, were announced at approximately $262,000, being an increase in net profits, as compared to the previous year, of $56,000.

Although the price of cement decreased materially during the past two years, the management stated that costs had likewise been decreased by improvements at the plant, and by the erection of silos at the various warehouses.

Ernst & Ernst certified that sufficient provision had been taken for possible losses on doubtful accounts, and that changes made in the permanent asset accounts, represent capital additions.

Following the stockholders' meeting the new board of directors named the following officers:

J. B. John, president; Homer Sly, vice-president; Herman Magnus, second vice-president; J. L. A. Galster, treasurer and general manager; and E. O. Nyman, secretary.

Lenawee Company Holds Annual Meeting

The Lenawee Sand and Gravel Company of Adrian, Mich., held its annual meeting and elected J. T. Carpenter of Blissfield to the board of directors. Other members include Fred Blouch, Holloway; Charles Thurlby, Tecumseh; Joseph Bachmeyer, Blissfield; Frank Hoffman, Monroe; Frank Schuler, Clinton; and John Murphy, Tecumseh. J. C. Carpenter was elected president; Fred Blouch, vice-president; and Charles Thurlby, secretary.

Western Quarry Elects Officers

The Western Quarry held its annual election of officers in the Legion Hall, Teveno, Wash. Andrew Wilson was reelected president; F. W. Wichman, vice-president; Geo. McMillan, secretary-treasurer, and George Dempsey elected to the board of directors to take the place of Sig Skarston.

NEW CORPORATIONS

Stuver Bros., T. J. Stuver, Sec.-Treas., Barberton, Ohio. $40,000.

Bluffton Stone Co., Raymond Conrad, Bluffton, Ohio. $50,000. Gilbert and Clair B. Fett, and Alfred Mueller.

Keen Lime Mfg. Co., R. G. Labenski, Dallas, Tex. $20,000. S. V. Labenski, Thomas B. Reagan.

Wilson Sand & Gravel Corp., John R. Wilson, Pres., 304 Market St., Camden, N. J. $50,000 pfd.; 1000 shares com. D. J. Shulman, Sec.

County Sand & Stone Corp., White Plains, N. Y. $850,000. E. R. Eckley, Mararoneck, N. Y.

Marcellus Mineral Products Co., Hans Frasch, Slate Hill, N. Y. $50,000.

Silver Lane Sand Co., H. L. Keeney, 26 Pitkin St., E. Hartford, Conn. $50,000.

John T. Kilcourse Co., John T. Kilcourse, Lawrence, Mass. 150 shares n. p. v. William A. Sullivan, John P. Kane.

Saugus Sand & Stone Corp., Paul Caputo, Boston, Mass. 1000 shares n. p. v. Benjamin Simeone, Medford, Mass.; Louis E. Pastorini, Waltham, Mass.

LEGAL INFORMATION FOR OPERATORS

Gravel Company Liable for Contract Made By Employe

It is established law that a purchaser is not required to accept and pay for merchandise which does not equal the quality specified in a contract of sale. However, an employer always is liable for failure to fulfill a sale contract made by an authorized employe, irrespective whether the goods are satisfactory.

For instance, in Southern Equipment Co. v. Drew Gravel Co., 124 So. 548, it was disclosed that the Drew Gravel Company sent an employe, named Dalton, to inspect and purchase several used dump cars from a company which had its equipment for sale. Out of a great many dump cars, which Dalton found there, he picked out four, accepted them for the gravel company and ordered them shipped to its plant. The cars were shipped, as per the orders, but, when they arrived the gravel company refused them on the alleged ground that the cars were unfit for use.

The gravel company wired the seller that the cars were in a poor condition, and the latter ordered the railway company to ship them back. The freight charges amounted to $300 and the seller sued the gravel company to recover this amount. The Court promptly held the gravel company liable, saying:

"The defense is that plaintiff (seller) breached its contract by shipping cars unfit for use. The defense might be good, but for one thing, to wit, the cars were picked out, accepted, and ordered shipped by defendant's inspector and agent, Dalton. . . . The cars would not have been shipped if Dalton had not picked them out and ordered them shipped. . . . The fact that Dalton had full authority to make the selection of cars to be shipped and in that respect to bind defendant (gravel company) cannot be, and in fact is not, seriously disputed."

Adverse Verdict Results in Seller's Failure to Comply With State Law

Probably one of the most important considerations, when filing suit to recover payment for materials furnished in public construction work, is that the various state laws have been thoroughly complied with. Otherwise the suit may be lost on mere technicalities.

For illustration, in Natural Rock Asphalt Corporation v. Highways Improvement Corporation, 168 N. E. 865, it was disclosed that a seller entered into a contract with a highway construction company to supply road construction material.

Pursuant to the terms and conditions of the agreement the seller furnished to the Highways Improvement Company the material at the agreed price of $15,374.34. All of the material was received and used in the performance of the contract with the board of commissioners, and the seller prepaid the freight thereon making a total due of $19,716.15.

When the construction company failed to pay the money due, the seller filed suit against a bonding company which had furnished a bond guaranteeing payment of the construction company's debts.

A state law makes it a condition precedent to the filing of a suit that the seller of materials file with state officials a verified duplicate statement within 60 days and that 30 *days* after filing of such verified duplicate statement *must elapse* before suit can commence.

The counsel for the seller failed to comply with this state law, and the higher Court held the bonding company not liable for payment to the seller, saying:

"The complaint does not allege the filing of such statement, and it is necessary, for the complaint to be sufficient, that it allege the necessary facts showing that it has complied with the statute and therefore there is a right to maintain the action."

Occupational Tax Law Held Valid

Usually any license or tax law is valid and enforceable by the terms of which motor-truck owners are required to pay reasonable license fees based upon the capacity of the trucks.

For example, in Clark v. Maxwell, 150 S. E. 190, it was disclosed that a state law provides:

"Every person engaged in the business of operating trucks for the transportation of property over the public highways of this state for compensation shall pay for license an annual tax as follows: For each such motor-propelled vehicle, carrying capacity of less than three tons, at the rate of forty-five dollars ($45) per ton. For such motor-propelled vehicle of a rated carrying capacity of three tons or over at the rate of seventy-five dollars ($75) per ton."

The proprietor of a trucking company hauling non-metallic products contested the validity of the law on the contention that the enforcement of such law deprives him of his property without due process of law and therefore the statute is in violation of the Fourteenth Amendment of the Constitution of the United States.

However, the higher Court held the law valid, and said:

"The General Assembly of the state, for purposes of taxation, classified all persons, firms and corporations. . . . The distinction made between the several classes, in accordance with said classification, rests upon reasonable grounds, having a substantial relation to the objects of the legislation. Having made a valid classification, the General Assembly had the power, which it has exercised in its legislative discretion, to prescribe different methods of determining the amount of the license tax imposed upon the subjects of the taxation, falling within the several classes, and to impose a license tax of varying amount upon such subjects of taxation. There is no provision of the Constitution either of this state or of the United States which forbids the General Assembly to exercise this power. The statute is valid; upon the agreed statement of facts, plaintiff (trucking company) was liable for the license tax."

When Contract Is Enforceable

Generally speaking, both parties to a valid contract are bound to fulfill the terms, irrespective of the fact that one of the parties discovers that another person is willing to perform the work at less cost.

For instance, in Nixon & Phillips v. Grant, 124 So. 216, a contractor agreed to pay the owner of a motor-truck a stipulated sum per yard for hauling rock. The contractor refused to pay for the work, because he discovered that other haulers were transporting the rock at a price considerably less than the price which he had agreed to pay. However, the Court held the contractor liable and said:

"The contract or offer of a different price to others did not vary the express contract under which plaintiff (hauler) hauled or worked for,"

RECENT PATENTS

PIT AND QUARRY *will furnish, at its actual cost, a copy of any patent cited below. A charge of ten cents per copy is made by the U. S. Patent Office, Washington, D. C., and readers may procure a copy directly by addressing the Commissioner of Patents, with payment for copies requested. Postage stamps are not accepted by the Patent office. We will endeavor to obtain copies of foreign patents for our readers but we cannot give assurance in every case for the reason that copies of such patents are not printed for distribution as liberally as are the American copies, nor is there a fixed charge per copy.*

American Patents

Concrete

Waterproof concrete and process of making same. Roy Cross, Kansas City, Mo., assignor to Silica Products Co., Los Angeles, Cal. No. 1,744,869.

Material Handling

Bucket-cleaner for trenching-machines. Charles F. Yocum, Findlay, Ohio, assignor to Buckeye Traction Ditcher Co., same place. No. 1,744-835.

Linkage connection for digging-booms. Harry H. Barber, Aurora, Ill., assignor to Barber-Greene Co. No. 1,744,942.

Measuring and Mixing

Measuring apparatus. William M. Venable, Pittsburgh, Pa., assignor to Blaw-Knox Co., same place. No. 1,-745,282.

Aggregate weighing and mixing machine. Erich H. Lichtenberg, Milwaukee, Wis., assignor to Koehring Co., same place. No. 1,745,174.

Pulverizing

Pulverizing machine. Paul A. Hirsch, New York, N. Y. No. 1,744,-895.

Pulverizer. Robert Sinclair, New York, N. Y., assignor to United Combustion Engineers, Inc., same place. No. 1,744,927.

Screening

Screen separator. John F. Isbell, Alhambra, Cal. No. 1,744,899.

Foreign Patents

Burning

Sintering machine. Joseph R. Linney. Canadian 297,001 and 297,002.

Process of, and oven or kiln for, baking pulverulent materials such as limestone. J. Bailey. British 309,177.

Rotary kiln. G. Polysius A. G. German 484,162.

Process and apparatus for calcining cement. Heinrich Peikert. German 481,579.

Mechanically operated grate for drawing of shaft kiln for lime, dolomite, etc. Walther Witschel. German 481,473.

Tunnel kiln. Dr. C. Otto and Comp. G.m.b. H. German 481,578.

Rotary kiln for calcining cement. Carl Mueller. German 481,649.

Feeding device for shaft kilns. Arno Andreas. German 485,978.

Process for operation of lime and dolomite kilns. Vulcan-Feuerung A. G. German 485,981.

Process for calcining cement. Ernst Meier. German 477,212.

Cement Manufacture

Lime or cement mortar. A. Genairon. British 306,038.

Process of manufacture of alumina cement. Compagnie de Produits Chimiques et Electro-Metallurgiques. Alais, Froges & Camargue. French 678,096.

Process and apparatus for calcining lime and natural cement. Louisville Cement Co. French 677,558.

Conveying and Elevating

Conveying and elevator mechanism. Coventry Chain Co., Ltd. British 323,604.

Conveyors. A. Redler. British 323,204.

Bucket for elevating concrete. T. Wageder. French 678,437.

Improvements in machines for handling coal and similar materials. H. Adams. French 678,544.

Coolers

Rotary cooler. Gebr. Pfeiffer Barbarossawerke. German 484,161.

Rotary cooler for rotary kilns. G. Polysius A. G. German 484,322.

Crushing and Pulverizing

Air separation device for grinding mills. Ernst Curt Loesche and Max Berz. German 484,299.

Tube mills. G. Polysius A. G. German 484,210.

Apparatus for tube or compound mills. G. Polysius A. G. German 484,498.

Hammer-mill. Hartstoff-Metall A. G. German 484,211.

Hammers for fine grinding mills. Hartstoff-Metall A. G. German 484,-212.

Peripherally driven grinding or crushing machines. P. L. Crowe. British 323,635.

Pulverizer and separator for solid products. Ateliers Reunis and F. Hippert. British 323,472.

Shaft packings for grinding mills. Hartstoff-Metall A. G. and E. Kramer. British 323,632.

Process for manufacture of balls, etc., for grinding mills. Fried, Krupp Grusonwerk A. G. French 678,521.

Improvements in coal pulverizers. W. A. White. French 677,966.

Drilling

Rock drills. Ingersoll-Rand Co. British 309,478.

Pneumatic tools. Armstrong-Whitworth & Co., Ltd. British 323,536.

Drilling tools. Sullivan Machinery Co. British 292,612.

Automatic feed devices for portable drilling machines. A. J. Wikander and O. Sjogren. British 323,274.

Power-driven rock drills. M. Kellow. British 323,238.

Rotation mechanism for percussive drills. G. Bollen. British 323,262.

Supporting appliances for rock drills and the like. G. H. T. Rayner and P. Rayner. British 323,443.

Electric process and apparatus for determining the ground traversed in drilling. Societe de Prospection Electrique. French 678,113.

Rock drills. Ingersoll-Rand Co. French 678,023.

Drill chuck. Ettco Tool Co., Inc. Canadian 297,080.

Excavating

Excavating machines. J. S. Withers (Koehring Co.). British 323,278.

Method of and means for dredging, excavating and conveying materials. A. G. Rotinoff. British 323,407.

Power shovel. P. E. Leroux. French 678,255.

Improvements in clamshell buckets. Societe Anonyme des Etablissements Caillard & Cie. French 678,127.

Method of dredging, excavating and conveying materials. Alexander George Rotinoff. Canadian 297,054.

Power shovel. William W. Sloane. Canadian 297,034.

Explosives

Detonator. Canadian Industries, Ltd. Canadian 297,054.

Detonators. O. Turek. British 308,781.

Miscellaneous

Closure devices for loading chutes. H. Aumund. British 323,494.

Sorting screen. C. C. Larsen. British 323,448.

Improvements in magnetic separator. H. H. Thompson and A. E. Davies. French 678,065.

Equipment and process for pouring cellular concrete and similar materials. L. Bourdelles. French 678,149.

Improvements in automatic bagging machines. Compagnie des Sacs a Valve Bates S. A. French 678,546.

Improvements in air compressors. Societe Establissements Samga & Bavox Reunis. French 677,547.

Process and apparatus for sorting materials by compressed air. Carlshutte A. G. fuer Eisengiesserei und Maschinenbau. French 678,010.

Screw for emptying pulverized material from bins. Teitzer Eisengiesserei und Maschinenbau A. G. German 484,424.

TRAFFIC NEWS AND COMMENT

Cement

A shipper of cement, shipping from York, Pa., has asked for reduction in rates to various destinations in West Virginia. At the present time class rates are applicable and it is the shipper's contention that he is entitled to rates shown below based on other rates to the same general territory.

TO STATIONS	Proposed rates
Adamston Mine, W. Va. to Cunningham Mine. W. Va., inclusive	16¢
Katherine, W. Va. to Vaughn Mine, W. Va., inclusive	15
Limestone, W. Va.	15
Consolidation, No. 50, W. Va.	16½
Consolidation No. 94, W. Va.	16½
Mendota, W. Va. to Salama, W. Va., inclusive	16

Cement from Points in Ohio and Indiana

The carriers in Central Freight Association territory have under consideration revision of rates on Cement from various producing points in Ohio and Indiana to destinations in West Virginia. The proposal is contained in Central Freight Association Docket 23720.

Examples of the proposed changes are as follows:

FROM BAY BRIDGE, OHIO TO	Present	Proposed
Sheperdstown, W. Va.	21¢	20¢
C. & O. R. R.		
Stillwell, W. Va. to Clover Lick, W. Va.	20	19½
Whiting, W. Va.	20	18½
Barton, W. Va.	20	18½
Lester, W. Va.	19	18½
Summerlee, W. Va.	18½	18
Western, Md.	..	..
Frests, Md. to Black Oak, Md.	19½	19
Wallman, Md to Kempton No. 42 Mine, W. Va.	19½	19
Piedmont, W. Va.	19	18
Monongahela R. R.		
Morgantown, W. Va. to Jct. Indian Creek Branch, W. Va.	17	16½
Hite, W. Va. to Rivesville, W. Va.	17	16
Radcliff, W. Va. to Fairmont, W. Va.	17	16
FROM CASTALIA, OHIO TO		
B. & O. R. R.		
Blue Creek, W. Va.	18	17
TO		
C. & O. R. R.		
Spice Run, W. Va.	20½	20
Buckeye, W. Va.	20½	20
Stillwell, W. Va.	20½	19½
	Present	Proposed
Durbin, W. Va.	20½¢	18½¢
Winterburn, W. Va.	20½	19
Admiralty, W. Va.	19	18½
Lester, W. Va.	19	18½
Vanwood, W. Va.	19½	19
Lochgelly, W. Va.	18½	18
N. & W. Ry.		
Rippon, W. Va.	21	20
Sheperdstown, W. Va.	21	20
W. M. Ry.		
Bellington, W. Va.	18	17½

FROM FULTONHAM, OHIO TO		
N. & W. Ry.		
Bluefield	16½	16
Nemours to Coaldale	16½	16
Algonquin to Widemouth	16½	16
C. & O. Ry.		
Clawson, W. Va. to Cass, W. Va.	17½	17
Glenwhite Jct., W. Va.	15½	14½
W. M. Ry.		
Orchard, Md. to Luke, Md.	17	16½
Piedmont, W. Va.	17	16½
FROM IRONTON, OHIO TO (Rep pts.)		
East Gulf, W. Va.	14	13½
Lester, W. Va.	13½	13
Glen White, W. Va.	13	13
Lochgelly, W. Va.	13	12½
FROM LIMEDALE, IND. TO		
Tommy Creek, W. Va.	..	21
Vanwood, W. Va.	..	21
Pemberton, W. Va.	..	20½
Skelton, W. Va.	..	20½
Eccles, W. Va.	..	20
Summerlee, W. Va.	..	19½
FROM MITCHELL, IND. TO		
Tommy Creek, W. Va.	..	20
Helen, W. Va.	..	20
Skelton, W. Va.	..	20
	Present	Proposed
Eccles, W. Va.	..	19½¢
Admiralty, W. Va.	..	19½
Summerlee, W. Va.	..	19
Millville, W. Va.	23½¢	24½
Charleston, W. Va.	23½	24½
Alba-Marle Lime Co., W. Va.	23½	25
Aldridge, W. Va.	23½	25
Summit Point, W. Va.	23½	25
FROM OSBORNE, O. TO		
B. & O. R. R.		
Clarksburg, W. Va.	16½	16
C. & O. Ry.		
Sillington, W. Va.	19½	19
Baylor, W. Va.	17	16½
Lester, W. Va.	17	16½
N. & W. Ry.		
Wheatland, W. Va.	22	21
W. M. Ry.		
Keyser, W. Va.	19	18
W. Va. Cent. Jct., W. Va.	19	18
N. & W. R. R.		
Rippon, W. Va.	22	21
C. & O. Ry.		
Wanles, W. Va.	19½	19
Durbin, W. Va.	19½	19
Thornwood, W. Va.	19½	19
Glen White, W. Va.	17	16½
W. M. Ry.		
Piedmont, W. Va.	19	18
Orchard, Md.	19	18
Luke, Md.	19	18
FROM PAINESVILLE, O. TO		
Virg. R. R.		
Affinity, W. Va. to Skelton, W. Va.	20	19½
N. & W. Ry.		
Matoaka, W. Va. to Weyanoka, W. Va.	20½	20
Hiawatha, W. Va.	20½	20
C. & O. Ry.		
Renick, W. Va. to Droop Mtn., W. Va.	20½	20
Harter, W. Va. to Cass, W. Va.	20½	19
Glen White Jct., W. Va.	19½	19
Lester, W. Va. to Sullivan, W. Va.	20	19½
Summerlee, W. Va.	19	18½
W. Md. Ry.		
Elkins, W. Va.	18	17½

Sand and Gravel

Central Freight Association Docket 23761 covers an application filed by a shipper requesting reduction in rates on sand and gravel from Lafayette, Ind., to various destinations in Illinois. Following are examples:

TO	Present Rate	Proposed Rate
Gilman	$2.80	$1.15
Onarga	1.23	1.15
Del Rey	1.23	1.15
Buckley	1.18	1.15
Ludlow	2.90	1.15
Rantoul	2.90	1.15
Thomasboro	2.90	1.15
Leverett	2.90	1.15
Champaign	2.90	1.15
Harpster	3.30	1.15
McNulta	3.30	1.15
Belleflower	3.30	1.15
Kumbler	3.30	1.15
Weedman	3.30	1.15
Farmers City	3.30	1.15

Sand and Gravel

A shipper has asked the Central Freight Association carriers to establish a new line of commodity rates on sand and gravel from Kaley Pit, located at South Bend, Ind., to various destinations in **Indiana.**

At the present time there are no commodity rates in effect and the following is a partial list of the representative destinations involved and the rates sought:

TO	Proposed Rates
(C. I. & L. Ry.)	
Gleason	80¢
Otis	85
Alida	85
Haskells	85
Wanatah	90
South Wanatah	90
LaCrosse	95
San Pierre	95
Anthonys	100
Medaryville	100
Francesville	105
Monon	110
Rensselaer	110
Dinwiddie	120
Dyer	100
St. John	105
Creston	105
Lowell	110
Rose Lawn	110
Fair Oaks	110
TO	
(N. Y. C. & St. L. R. R.)	
Belfast	76
LaPorte	76
Dillon	80
Walkerton	82
Plymouth	82
TO	
(P. M. Ry.)	
LaPorte, Ind.	90
Wellsboro	95
Thomaston	95
LaCrosse	100

Ground Limestone

The carriers in Eastern Trunk Line Association Docket 22560 (supplement 1) are giving consideration to a reduction of ½c on Ground Limestone from B. & O. producing points in the Grove, Frederick, Security, Md., Engle, Martinsburg, Charles Town, W. Va., Winchester, Cedar Creek and Strasburg Junction, Va., districts, to destinations on the N. Y., N. H. & H. Railroad.

MANUFACTURERS' PUBLICATIONS

Each publication listed below contains information of interest to non-metallic mineral producers. Readers may obtain, without charge—except where a price may be stated—and without obligation, copies of any of these publications by writing directly to the manufacturers who publish them. Please mention PIT AND QUARRY *when making such requests.*

Bins

Super Concrete Stave Storage Bins for Plants. 4 p., 7 ill. (Neff & Fry Co., Camden, O.) Discusses the bin made of concrete staves and calls attention to a book recently published by the company, which is devoted exclusively to the discussion of gravity storage bins.

Bodies, Truck

Jaeger Trailor Truck Mixer, Self-Dumping Type that Mixes in Transit. 8 p., 21 ill. (Bulletin TM-1930, The Jaeger Machine Co., Columbus, O.) Describes the mixer and contains considerable information on the advantages of this type of concrete.

Mixing Concrete and Mortar. 16 p., 27 ill. (Bulletin 50, Highway Truck Mixer Co., Cleveland, O.) Gives considerable information on the construction and use of these bodies together with excerpts from an article by A. Hirst, "Tests of Truck Mixed Concrete," published in May 16 issue, *Engineering News Record.*

Via the Movable V Concrete Body. 12 p., 19 ill. (Bulletin No. 65. The C. O. Bartlett & Snow Co., Cleveland O.) Shows and discusses the advantages of the V body in handling ready-mixed concrete and mortar.

Brick

Fresh Treatment of Old Problems Is Found Through the Use of Sand-Lime Brick. 1 p., 1 ill. (The Jackson Brick Co., Jackson, Mich.) Shows advantages of Using Sand-Lime Brick.

Eight Advantages of Buying Laclede Fire Brick. 4 p., 12 ill. (Laclede-Christy Clay Products Co., St. Louis, Mo.) Lists a number of products and notes their advantages.

Modern Refractory Practice. 178 p., 337 ill. (A bound volume of unusual merit. Harbison-Walker Refractories Co., Pittsburgh, Pa.) A real volume of engineering value on refractory practice. While special reference is made to Harbison-Walker products, this volume is undoubtedly the most comprehensive treatise on the subject ever offered to those interested in the most modern practice. The engineering data are so comprehensive that this volume should be in the library of any firm which uses refractory material in any way.

Cement

Winter Construction with "Incor." 8 p., 9 ill. (International Cement Corp., New York, N. Y.) Describes with text and graphs the opportunities for winter construction with "Incor" high early strength cement.

Cement Application

Road Reconstructing Without Detouring, by W. A. Van Duzer. 3 p., 3 ill. (Reprinted from *Engineering News Record* and distributed by the International Cement Corp., New York, N. Y.) Describes the advantages of using "Incor" perfectly high early strength cement.

Compensators

CR7051 Automatic Starting Compensators for 2-phase and 3-phase Squirrel-Cage Induction Motors. 4 p., 9 ill. (GEA-416B supersedes GEA-416B. General Electric Co., Schenectady, N. Y.) Different classes of the same general type are discussed.

Compressors and Vacuum Pumps

Single and Two-Stage Air and Gas Rotary Compressors and Vacuum Pumps. 8 p., 11 ill. (Bulletin C-1. Fuller Company, Catasaqua, Pa.) Shows and describes the construction and operation of these machines as applied to their different duties.

Crushers

Style "B" Newhouse Crusher. 16 p., 12 ill. (Bulletin No. 1469-A. Allis-Chalmers Mfg. Co., Milwaukee, Wis.) This crusher is comprehensively described in the text and illustrated, operating under varied conditions.

Drives

Caldwell Elevator Drive. 24 p., 26 ill. (Book No. 1088, H. W. Caldwell & Son Co., Link-Belt Co. Owner, Chicago.) Illustrates the different adaptations of this drive and describes its construction.

Dryers

Continuous Centrifugal Dryers. 4 p., 3 ill. (Elmore Centrifugal Products Corp., St. Louis, Mo.) Illustrates and describes this method of drying sand and other washed materials.

Engineering

Quality Engineering. 20 p., 10 ill. (Booklet of unusual artistic design. American Hoist & Derrick Co., St. Paul, Minn.) Presents a claim for unusual engineering practice in meeting the demands of progress. The booklet is profusely illustrated with types of machinery, manufactured by the company.

Equipment, General

Put 1930 Across With New Equipment. 2 p., 10 ill. (*Wood Hoister,* Jan. 1930. Wood Hydraulic Hoist and Body Co., Detroit, Mich.)

Feeders

Hardinge Constant Weight Feeder. 4 p., 7 ill. (Bulletin No. 33. Hardinge Co., York, Pa.) Describes this machine for feeding materials by weight and weighing the fed materials at a constant rate.

Mills, Tube

Black Stone the Genie of Power. 4 p., 7 ill. (Kennedy-Van Saun Mfg. & Eng. Corp., New York, N. Y.) Gives a history of the discovery of coal and the application of the Kennedy-Van Saun air-swept worm-driven tube mills and pulverizers to get the most heat from coal.

Motors

Totally Enclosed Fan-Cooled Squirrel-Cage Motors 900 Series Frames. 2 p., 2 ill. (GEA-724B supersedes GEA-724A. General Electric Co., Schenectady, N. Y.) Devotes attention to 3- and 2-phase 1½-hp. to 15-hp. squirrel cage motors.

Type BD Direct-Current Motors. 4 p., 13 ill. (GEA-752A supersedes GEA-752. General Electric Co., Schenectady, N. Y.) Describes the construction and sizes of these motors by illustrating each part.

Pumps

Morris Heavy-Duty Lined Dredging Pumps, 12 p., 13 ill. (Bulletin 136, Morris Machine Works, Baldwinsville, N. Y.) Describes, illustrates and shows by line drawing the new pump which was also described in PIT AND QUARRY, Dec. 18, 1929, page 158.

Pumping 270 Tons of Sand and Gravel per Hour. (Bulletin No. P2, American Manganese Steel Co., Chicago Heights, Ill.) Describes the Oxford, Mich., dredging plant of the Koenig Coal and Supply Co., using an Amsco pump and an Eagle Swintek nozzle ladder. Published in PIT AND QUARRY, Feb. 13, 1929, page 84.

Double-Suction Single-Stage Centrifugal Pumps. 4 p., 6 ill. (Bulletin No. 214. Pennsylvania Pump & Compressor Co., Easton, Pa.) Gives a complete description of the pump with useful charts and diagrams.

Rotary Pumps. 4 p., 19 ill. (Bulletin No. 39. Beach-Russ Co., New York, N. Y.) Devoted to a description of different classes of small vacuum pumps.

Screens

The Inside Story of the S-A Vibrator Screen. 9 p., 10 ill. (*Labor Saver,* Jan. 1930. Stephens-Adamson Mfg. Co., Aurora, Ill.) Describes the construction, operation and uses of the new S-A vibrator screen.

The New Woven-Wire Screens for Coarse Sizing. 4 p., 3 ill. (The Ludlow-Saylor Wire Co., St. Louis, Mo.) Describes the advantages of using "Arch-Crimp" wires for resisting abrasion.

INSURANCE PROBLEMS DISCUSSED

Automobile Insurance

Although public liability and property damage insurance are of outstanding importance, as was discussed in the last issue of this magazine, the field of automobile insurance is even broader in many respects. In the first place, the coverage is divided into several separate subjects, as follows: Public liability and property damage (these are the forms which cover the car owner's responsibility for damage to others); also fire, theft, collision, tornado, glass breakage and riot (this group covers the risks of loss or damage to the insured car itself. The reason for listing these as separate risks is so that each automobile owner may choose for himself the items which he considers important, and need not pay a premium for any risk which he prefers to leave uninsured.

In connection with insurance covering loss or damage to the car itself, such as fire and theft coverage, the most frequent and perplexing questions concern the insurable value of automobiles. What is your car worth? Not what did it cost, or what you could sell it for as junk, or what it is worth to you as a matter of utility. But what would a loss adjuster appraise it at. Automobiles depreciate very fast in commercial value, not because they wear out but because the second hand market in most parts of the country is overloaded and changes in style or model make good machines obsolete in a short time. Most car owners have a very exaggerated notion of the worth of their property, and few indeed are willing to face the facts of actual market conditions.

Insurable Value

Like a building, a printing press, or any other insurable property, the value of an automobile is supposed to be the cost of replacement in the same condition, with due allowance for wear and tear and obsolescence. Look at the situation from the point of view of the insurance company. Suppose your car has been stolen. The adjuster figures he can go into the market, buy a car of the same model and age as yours, spend a little money on paint, repairs and tires, and give you a machine just as good as the one you lost. That is all your car is worth. Roughly speaking, this is about equal to the trade-in value.

Insurance policies are written in three different ways as regards the determination of the value of an automobile. Some companies issue a policy which names a guaranteed amount that will be paid in the event of total loss with no argument or adjustment. Almost invariably in such cases the amount of insurance is reduced by one or two per cent every month to keep pace with the depreciation of the car. The most common form of policy, however, is one which names a certain amount, which is presumed to be the insurable value at the beginning of the policy year, and then leaves the loss to be determined by the insured and adjuster at the time loss occurs. The third form names no amount at all and covers the "actual value" at all times.

Choice of Form

On the surface it would appear that the guaranteed amount policy is the only one to buy. However, other factors enter into the picture, and while this so-called "valued" policy may be best under some conditions, the forms with no guarantee are the most common and are most generally satisfactory. The guaranteed value policy in many cases pays a car owner more than his car was worth; this is certainly bad from the public standpoint and creates a moral hazard. Secondly, many companies which use this form as sales "bait" are financially weak. Finally, the guaranteed value applies only in the case of total loss. Probably nine out of ten losses involving fire, theft and collision do only partial damage. In such cases it is still necessary for the insured to agree with an adjuster on the extent of damage done. In summary, then, we may conclude that while a guaranteed value policy is theoretically more profitable to a loss claimant, the most important consideration is the reputation of the insurance company, and you should choose a company that is known to be fair and liberal in all its dealings rather than one which has a technically ideal policy form.

What to Insure

In our first sentence we named many different kinds of automobile insurance. Which of these should you carry on your own car? Of course, if you want the peace of mind that goes with full coverage you will carry all of them. However, the seriousness of some risks varies in different parts of the country, and in some cases you might feel that the standard rate was too high for your particular circumstances. Almost every car owner carries fire and theft insurance, because these risks are universal. Public liability and property damage coverage are also generally carried, as has been previously explained. Whether you should carry glass breakage, riot and civil commotion, tornado, hail and water damage depends on the neighborhood you are in, the build of your car, or the nature of your business, and you will best secure personal advice from your own insurance agent.

Collision

The most debatable coverage of the automobile insurance policy is the collision feature. This covers damage to your own car, whether caused through your own fault or otherwise. In rural districts motorists hesitate to buy the protection because collisions are comparatively infrequent. In the cities, where accidents are common, they object because the rates seem very high. The answer should be to the rural driver that he gets a low rate, which he can well afford to pay to protect himself against the loss of his car. And to the city man we say that the rate is high only in proportion as the risk is great, and he can hardly dare to take his own chances. In particular, every car and truck should be insured for at least the first year or eighteen months of its life, because it is then most valuable and its loss would certainly be a strain on the pocketbook of the owner. It is reasonable for the owner of an old car to decide for himself whether the small value of his machine is worth insuring regardless of price.

As is well known, full coverage collision insurance is usually not the best form of policy. If you are going to collect for every nick in a fender you will have to pay a very high price. The most economical form, therefore, is one which omits small losses (which the insured can well afford to stand himself) and pays only the excess over $50, or some other agreed amount. This form takes care of the big losses satisfactorily at a cost which is moderate. It is impossible to lay down a general rule as to whether you individually should carry full coverage or some other specific form. That must be worked out according to your own needs by a personal conference with your broker.

REVIEW OF FOREIGN PRACTICE

New Process for Using Slag

Utilization of blast-furnace slag as road material is expected to be greatly stimulated by a new process developed by Bolckow, Vaughan & Co., Ltd., Middlesbrough, in which the molten slag is converted directly into road material, eliminating the cost of dumping and subsequent working. Slag from the basic blast furnaces is run into ladles which take it to casting pans alongside the furnaces, where it is cast into large cakes about 15 in. thick. While cooling, the slag anneals itself and a material almost as hard as granite and impervious to water is secured. The slabs, when cool, are broken and crushed, screened and graded ready for delivery to the user. A remarkable feature is that this material is supplied to a definite analysis, and consequently possesses an advantage over material worked from disused slag dumps. The disposal of slag has been a great problem to the iron producers, who have even had to resort to the expedient of sending the slag to be dumped into the north sea. Since the war great inroads have been made in the old slag dumps, and some of them have even been worked out.—*The Engineer* (London), 147:478, Nov. 1, 1929.

Notable New Electric Hoist For German Potash Mine

The present steam hoisting machine in shaft I of the Salzdetfurth potash works (Germany) is being replaced by a new electrical hoist of the Leonard system, built and installed by the Siemens-Schuckert Works, and will go into operation about the first of 1930. The hoisting drum is direct-driven by a D. C. shunt-wound motor, which in turn is driven by current from a generator. The hoist carries a useful load of 4,920 kg. (10,824 lb.) of materials or 3,150 kg. (6,930 lb.) in passenger service. Its maximum speed, in material handling, is 15 m./sec. (49.2 ft./sec.) and its capacity at 775-m. depth (2,542 ft.) is 165 to 183 tons an hour. The hoisting drum is 6 m. or 236 in. diameter and makes 47.8 r.p.b. The hoisting motor is designed for an effective capacity of 1010 kw. at 47.8 r.p.m., and its armature voltage is +890 volts. The installation includes safety devices of the latest type, including a special safety brake.—*Kohle und Erz* (Berlin) 26:825-6, Sept. 27, 1929.

New Type of Paper Sack

A new type of paper sack for cement and lime has recently been introduced in Europe under the trade name "Jar," having the peculiarity of being constructed of a single sheet of paper rolled so as to form several thicknesses or layers. One of the layers (the second in the case of four or the third in the case of five or six) is rendered impermeable by means of a preparation appropriate for the material to be bagged, this preparation having an oil base for cements, limes and plasters and paraffin base for certain other materials. The impregnating of the interior layer avoids contact of the impermeable material with the material to be sacked, and at the same time avoids damage by scratches on the outer layer. Only the bottom of the sack is sewed, and the bags are filled by special machines as in the case of the valve bags. This article describes in some detail the "Haver" bagging machine made at Oelde, Westphalia. —J. Prouteau, *Revue des Materiaux de Construction*, Nov. 1929, pp. 414-6.

Relation Between Cement Fineness and Loss of Strength in Storage

Much has been written on the effect of storage on the quality of portland cement, but in this literature there is little discussion of the effect of the fineness of the cement. A series of tests made at the laboratories of the Azuga (Roumania) cement plant lead to the following conclusions: (1) The quality of cement stored where it is protected against moist air is not affected after even a very long period of storage; (2) Likewise, the fineness is not affected when stored in this manner; (3) Cement exposed to the action of moist air suffers a loss of strength; (4) Along with the loss of strength the percentage passing the test sieves is diminished, and (5) The finer the grinding of the cement, the greater is the action of moisture and the loss of strength in the cement.—N. Nicolaesco, *Revue des Materiaux de Construction*, Nov. 1929, pp. 401-2.

Hydraulic Lime for Masonry Construction

Because of its durability, cheapness and strength, portland cement has in America monopolized the field of cementing material in all forms of hydraulic construction and most all masonry structures of magnitude. In countries such as China, however, due to conditions of transportation and labor cost, it may not always be the best material to use, as good engineering practice requires making the best use of materials locally available. An American engineer, E. W. Lane, in *Journal of the Assn. of Chinese & American Engrs.* (Peiping) (10: 19-34, Sept. 1929) recommends the consideration of *artificial hydraulic lime* made from burned lime and clay.

Ordinary lime has no "hydraulic properties;" that is, it is soluble in water and cannot be used for hydraulic construction. Lime burned from limestone with a small content of alumina and silica—natural hydraulic lime—does have hydraulic properties, but such stone is not of general occurrence. In the early nineteenth century, Vicat discovered that mixing slaked common lime with a small portion of clay and reburning it gave an artificial hydraulic lime that could be slaked and used as with ordinary lime. This led to Aspdin's invention of portland cement (in which the mixture of calcerous and argillaceous materials is farther heated to an incipient fusion and then ground), and this has monopolized attention in America and most European countries. Vicat's material, however, has been developed elsewhere, and has been used extensively in Egypt and India. It can best be made by burning clay in a kiln, as bricks are made; the burned clay is pulverized and thoroughly mixed with slaked lime and sand to make mortar, and such mortar mixed with broken stone or brick to make concrete. About 13,000 yds. of this material entered into the great Assuan Dam in Egypt but its use was superseded by 1:4 portland cement mortar because it could not be supplied fast enough. Used in dams in rubble or concrete it is not as strong as the 1:2½:5 concrete commonly used in the United States, yet it is strong enough that dams of considerable height have been built with it. The author gives several examples with data on strengths developed.

LATEST NEWS FLASHES

Pacific Coast Lands Large Order

Landing of an order for 350,000 barrels of cement—by far the largest ever handled in Seattle and one of the largest in the history of the cement industry on the Pacific Coast—was recently announced by N. D. Moore, vice-president of the Pacific Coast Cement Company. While the amount of money involved was not revealed, it was believed that it would be in the neighborhood of $1,000,000.

The cement is to be used in construction of the new Lewis River dam, 200 feet in height, which is part of a $10,000,000 hydroelectric development for the Northwest Electric Company of Portland. Negotiations for the contract had been in progress for three months. The order will provide additional work for men in both the cement and the coal industry, as well as in allied lines, and a material increase in payrolls will be necessary next fall, when the largest shipments of 50,000 barrels a month will be required. The work will continue until September 1, 1930.

Deliveries will be made to Woodland, Wash., in bulk, in specially sealed box cars, and thence twelve miles up the river to the dam site by trucks.

Eighty thousand tons of limestone and more than 25,000 tons of clay will be quarried for this order, which will require 1,500 freight cars. Another 500 cars will be needed to handle the coal used in making the cement.

Big Diesels Go to New Mexico

The Buda Company at Harvey, Illinois, has shipped to the New Mexico Construction Company, Albuquerque, New Mexico, four Model D4-30 Buda-M.A.N. diesel engines. These units develop a maximum of 120 b.hp. and operate at a speed of 800 r.p.m. to 1,000 r.p.m. They are to be used for operating Cedar Rapids No. 2 Crushers, in connection with highway construction.

These engines are mounted on skids, which enables them to be moved from one job to another with a minimum of effort. They are completely enclosed with sheet metal housing, which may be locked by means of a padlock at night to eliminate any danger of malicious tampering with the engine. The radiator is the conventional Automotive Type, made in sections, so that in case of damage, a single section may be removed and repaired without interrupting the operation of the engine, except for the brief time required for the removal and replacement of the section.

These units are fitted with an outboard bearing and paper belt pulley. Clutch is of the disc type, totally enclosed in the conventional type bell housing. The net weight of these units, complete, is approximately 9,000 pounds.

Starting is handled by means of a small two cylinder air-cooled gasoline engine, which is mounted on the flywheel housing and starts the diesel through a special Bendix drive. This eliminates the use of accessories and makes the units complete and self-contained. The Buda Company is building two other sizes of these engines, developing 92 hp. and 180 hp. respectively, and numbers of these engines are being furnished for many different classes of service.

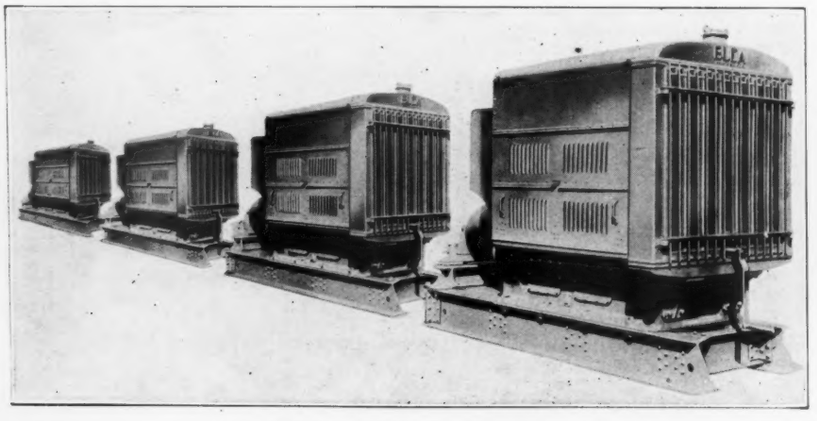
Trackson Company Expands

In keeping with its recently adopted expansion program, which provides for the development of a complete line of Trackson tractor equipment, officials of the Trackson Company have announced plans for the erection of a new factory early in the spring. According to W. H. Stiemke, vice-president, and L. E. Dauer, sales manager, the company has obtained a very desirable site of 21 acres in Milwaukee's south side manufacturing district.

The new plant will be a one-story building, up-to-the-minute in plan and construction and equipped to provide every facility for most efficient, modern production. It is planned to make it not only a model manufacturing plant, but an attractive, imposing building, as well, that will be an addition to Milwaukee's industrial section. Among other things, the plans call for the landscaping of the property as soon as the building is completed.

The entire Trackson plant will be housed in the new factory, which will provide ample room for the manufacture of the complete line of tractor equipment which the company is developing. Also, the move will consolidate under one roof the several plants which the Trackson Company now operates in Milwaukee.

The addition of other lines which the Trackson Company plans to manufacture when it is established in the new factory is expected to put it at the head of the tractor equipment industry, as the world's biggest manufacturers of a complete line of such equipment.



Diesels ready for shipment

Overnight Service on Drives Started by Maker

To one who is at all observant of what is going on in the field of industry, it is apparent that better distribution of materials and supplies is a definite trend of the times, and this is not surprising, for it is the next logical step following the simplification program which was so skillfully fostered by President Hoover while he was Secretary of Commerce. One result of this movement toward better distribution is the locating of large stocks of standard parts required by industry, in strategic centers throughout the country—a result which benefits both the maker and user. Coupled with the trend toward simplification, it reduces losses formerly incurred by users in paying premiums of time and money for special goods shipped from distant points.

An exponent of this modern distribution efficiency is the Link-Belt Company, Indianapolis, Indiana, known for over 50 years as a manufacturer of power transmission and materials handling equipment. Silent chain drives have been stocked by Link-Belt distributors for 6 years. Now comes the latest extension of this power transmission service with the "stocking" of Link-Belt roller chain drives (the two wheels and the chain) by local distributors, on about the same basis. These two types of drives, silent chain and roller chain, are employed in a large percentage of all power transmission jobs, and their quick availability throughout the country constitutes a service which is convenient and economically desirable.

To enable chain users to take fullest advantage of this service, Link-Belt has further prepared an entirely new data book on Roller Chain, which contains such complete engineering information and tables that the user can select the correct drive for his particular purpose, figure the price, and order the drive from a distributor or dealer for immediate delivery. The roller chain drive has earned an excellent reputation for efficiency and dependability. Roller chain is capable of carrying heavy loads at moderate chain speeds, and is extremely durable and efficient on second reduction drives and similar applications.

"Caterpillar" Dragline Operations

A dragline scraper is a digging, conveying, and self-dumping tool which can be controlled and operated entirely by a one-man crew. A two-drum hoist, such as the Willamette-Ersted "Hyster," mounted on a "Caterpillar" Tractor, is an ideal power unit for operating this scraper and will move dirt for distances up to 350 ft. The average and most economical operating span is about 200 ft. The scraper is controlled with two clutch levers which operate the two drums of the hoist—one hauls in the loaded scraper, and the other hauls it back when empty.

The slack line cableway bucket is a refinement of the dragline principle, arranged to deposit the earth or gravel which is handled at the foot of a mast or gin pole. It consists of a track cable on which the trolley and bucket travel. The cable is alternately slackened or tightened to raise or lower the bucket from the gravel pit or river bed from which it is extracting gravel. A "haul-in-line" is attached to the bucket to haul it up the cableway or "track cable." Since only two drums are required to operate this type of bucket, a "Caterpillar" Tractor equipped with a double drum hoist makes a suitable power unit.

A crawler tractor operating a dragline

Applications for both dragline scrapers and slack line cableway buckets are as follows:

Excavating sand and gravel from bank or hillside
Excavating sand and gravel from shallow pits
Excavating sand and gravel from river beds or lake bottoms, commonly known as "wet pits"
Stripping overburden
Making cuts and fills
Cleaning out reservoirs
Deepening lakes or ponds
Grading building sites
Storing and reclaiming coal, gravel, and other materials
Filling back of bulk heads
Building small earth dams
Filling in behind bridge abutments.

The above uses are found in county operations in gravel for road maintenance; gravel contractors supplying state and county under contract; state highway departments for making small cuts and fills, particularly on realignments of grades.

Sand and Gravel Men Inspect New Crusher at Memphis

An interesting event which was not on the official program but which occurred during the recent convention of the National Sand and Gravel Association was an excursion sponsored by the Allis-Chalmers Company to the plant of the Central Sand and Gravel Co., about seven miles southwesterly from the business center of Memphis on the bank of the Mississippi River. W. W. Fischer, general manager, cooperated with Allis-Chalmers representatives in showing a good time to about 140 guests who traveled to and from the Peabody Hotel in chartered taxicabs. A general inspection of the plant was made, visitors even boarding steamers and barges included in the company's fleet. Interest, however, centered in the brand new installation of a Newhouse Type B crusher with its self-contained motor and wire-rope suspension. A bounteous barbeque was enjoyed by all.

Northwest Concrete Products Men Choose Officers

At a two-days meeting in Seattle, Wash., beginning Jan. 24, the Northwest Concrete Products Association elected the following officers for the ensuing year: President, Hans Mumm, Everett, Wash.; first vice-president, Clyde Brutve, Portland, Ore.; second vice-president, Carl Warren, Spokane, Wash.; third vice-president, E. L. Warner, Tacoma, Wash., and secretary-treasurer, W. M. Hews, Yakima, Wash.

Marion Steam Shovel Co. Issues New Bulletins

The Marion Steam Shovel Company has issued a new bulletin, No. 343, describing its line of Type 450, 1¼-cu. yd. excavators in electric, diesel-electric and gas-electric powers. This 16-page bulletin illustrates in detail the advanced construction of Marion small revolving electric-powered excavating equipment. A similar bulletin, No. 339, has been issued on the Type 450 steam machines.

A new bulletin has also been published illustrating and describing the Type 490 electric heavy-duty quarry or coal-loading shovel with a dipper capacity of 2¼ cu. yd. and 3 cu. yd., depending on its use as a quarry shovel or coal loader.

Appleton Company to Produce Sand and Gravel

The Appleton Transfer and Ice Company of Appleton, Minn., has completed a deal to produce washed

sand and gravel on the 160-acre property of the Minnesota Pipe and Tile Company at Appleton. The plant has recently been remodeled and brought more up-to-date.

The material is lifted by a 10-in. dredge pump to a dewatering sump at ground which is about 25 in. above water level. It is then taken by a bucket line to the top of the plant where the different sizing is done over a three-deck Plato-O vibrator screen and taken to a paddle tank for washing, and the oversize to a Good Roads crusher, and flows to the sump to be returned to the tower for screening.

Pennsylvania Pump and Compressor Appoints Representative

The Pennsylvania Pump and Compressor Company has announced the appointment of the Kring-Becker Engineering Company, Cincinnati, O., as its representative in the Cincinnati and Louisville territories. The Pennsylvania Pump and Compressor Company is now offering, in addition to its regular line of spherically seated bearings, ball-bearing type pumps, suitable for capacities up to 1800 g.p.m. against heads up to 300 ft.

Albany Gravel to Open New Dredging Plant

The Albany Gravel Co., Albany, N. Y., has leased land for a plant site at Croton-on-Hudson and has its plans clearly defined. It proposes to use an 8-in. Morris dredge pump, mounted on a scow, which will discharge into the washing and screening plant. This gravel will be loaded from the bins and the sand is to be carried out on a steel conveyor with a belt to the tunnel for loading. Other equipment will include an Erie gas-air shovel with a 1-cu. yd. bucket and two 3½-ton dump body Autocars.

Appointees to Ohio Valley Shipper Posts

Three Indianapolis men were elected to executive offices in the Ohio Valley Shippers' Association this week.

They are L. E. Banta, traffic manager of the Indianapolis Building Trades Association, elected alternate general chairman of the association; Frank C. Baldridge, traffic manager of the U. S. Rubber Company in Indianapolis, general secretary, and William P. Busch, traffic manager of the Link-Belt Company of Indianapolis, member of the executive committee.

Paul C. Hodges, vice-president of the Marble Cliff Quarries Company of Columbus, O., was named general chairman. Officers were recently elected by the advisory board of the association.

Finishing Lime Association Of Ohio Announces Progress

The Finishing Lime Association announces that the Washington Building Lime Company of Baltimore, Md., is now a member of The Finishing Lime Association of Ohio. It is one of the oldest producers of finishing hydrated lime, and operates a modern 32-kiln plant at Woodville. The addition of this firm to the Finishing Lime Association of Ohio strengthens the Association, and places it in a very strong position as now representing about eighty per cent of the finishing lime tonnage.

The Association is comprised of the leading manufacturers of finishing hydrated lime, who are as follows:

The Kelley Island Lime & Transport Co., Cleveland, O.
The Gibsonburg Lime Products Co., Gibsonburg, O.
The National Lime & Stone Co., Findlay, O.
The National Mortar & Supply Co., Pittsburgh, Pa.
The Ohio Hydrate & Supply Co., Woodville, O.
The Woodville Lime Products Co., Toledo, O.
The Washington Building Lime Co., Baltimore, Md.

The Association has been in operation for a period of three years, operating on a national scope through district field offices.

Wisconsin Concrete Products Meets in Milwaukee

The annual convention of the Wisconsin Concrete Products association opened Jan. 29, at the Plankinton hotel in Milwaukee with an address by D. R. Collins, Milwaukee, president of the association. Others on the program the opening day were Secretary Jack Franklin, Milwaukee; D. M. Allan, Ted Merriam, both of Chicago; and district representatives.

Thursday morning there were discussion and addresses by L. J. Westerveld, Wausau; Charles Van Houten, Chicago; W. C. Muehlstein, Madison, state building inspector; Leon M. Gurda, Milwaukee, city building inspector; and Gene Olsen, Adrian, Mich. The annual business session was held in the afternoon. The following are district representatives: Ed. Olson, Oshkosh; George Kahler, Prairie du Chien; Harry Sorenson, Racine; Al. Kruscke, Eau Claire; Charles Clare, Madison, and L. E. Schwalbe, Milwaukee.

Foote Bros. Appoint Texas District Representative

The Ammex Equipment Company, 406 San Francisco St., El Paso, Tex., has been appointed by Foote Bros. Gear and Machine Company as district representative of the Texas territory lying west of a line drawn from Farwell to Sweetwater and then south to Spofford, including all of New Mexico, and all the States of Mexico, except the States of Nuevo Leon and Tamaulipas.

Slate Men Re-elect W. H. Smith

Re-election of William H. Smith of Bangor, Pa., as president, and the promulgation of a code designed to foster improved trade relations in the slate industry featured the closing sessions of the National Slate Association Jan. 22 in the Hotel Commodore. Other officers chosen were W. A. LeSeur, Ore Bank, Va., vice-president; Harry Stoddard, Pen Argyl, Pa., treasurer; W. S. Hays, Philadelphia, secretary; Arch M. Jones and John Williams were named directors.

New Quarry Opened Along Yellowstone River

The Northern Pacific Railroad is opening a quarry at Emigrant, Mont., between Livingston and Yellowstone Park, to provide rip-rap material for protecting its property from encroachments by the Yellowstone River.

New Explosives Company Headed by J. S. Burton

J. S. Burton and associates have organized Burton Explosives, Inc., to engage in the explosives and chemical business, with headquarters at 922 Guardian Building, Cleveland, O. Arrangement has been made to handle Union explosives to all territory lying east of the Mississippi River.

Michigan to Lease Its Mineral Lands

A definite policy under which it will dispose of non-metals taken from land in which the state owns mineral rights, by lease, will be declared soon by the conservation commission. At its last meeting the commission rejected several applications for purchase of certain non-metallic mineral rights on state-owned land. The ap-

plications were for limestone and gravel.

In November the commission adopted a general policy of disposing of metallic and non-metallic minerals by lease and not by outright sale. Later, definite lease provisions were formulated with stipulated royalty rates for disposing of oil and gas. The lands and geological survey divisions of the department will now draw up lease provisions for disposing of non-metallic minerals on a similar basis.

Atlas Car & Mfg. Co. Appoints Chicago Representative

The Atlas Car and Manufacturing Company announces the appointment of Goggin & Mills, 5 So. Wabash Ave., as Chicago representatives for the sale of its products consisting of industrial equipment, industrial storage-battery and trolley locomotives, storage-battery trucks and tractors, and industrial cars, track, and turntables.

New Canadian Gypsum Plant

Gypsum, Lime and Alabastine, of Canada, Limited, formerly the Canada Gypsum and Alabastine Company, Limited, will erect a new plant at East Calgary. A site, consisting of eight acres, has been secured, and excavation work will be commenced immediately. The initial construction program will be between $140,000 and $150,000 and the plant will manufacture wall plaster and gypsum tile. As soon as is practical, the company plans adding a plaster wallboard mill and will eventually bring a full line of its products into manufacture at this point.

For supplies, the new plant will depend on the Portland quarries near Kamloops, B. C., at present, but the company plans to develop its own quarry near Wardner, B. C., in the Crow's Nest Pass, in the near future.

Wood Hydraulic Hoist Purchase St. Paul Company

The property and assets of the Hydraulic Hoist Manufacturing Company, St. Paul, Minnesota, builders of the St. Paul Hoist, have been purchased by the Wood Hydraulic Hoist and Body Company, of Detroit, Mich. Wood Hydraulic Hoist and Body Company wishes to announce that the business of the Hydraulic Hoist Manufacturing Company will continue under the same management and St. Paul hoists and bodies will be marketed through the same dealer organization which has handled St. Paul hoists and bodies in the past.

Plans are in effect to build a body plant at St. Paul or Minneapolis to take care of the requirements for bodies specified for shipment with hoists out of St. Paul. The body plant will concentrate on a standard line of steel dump bodies particularly for use with the St. Paul hoist. The name of the company has been changed to St. Paul Hydraulic Hoist Company.

Longyear Moves Offices

After February 1, 1930, the offices of E. J. Longyear Company will be located at 1701 Foshay Tower, Minneapolis, Minnesota.

COMING EVENTS

Feb. 21, 1930. New York, N. Y. Feldspar Grinders' Institute meeting at New York Athletic Club. W. J. Parker, commissioner, 7 East 44th St., New York.

Feb. 25-28, 1930. Wichita, Kan. Fifth annual Southwest Road Show and School at the Coliseum. Secretary, P. O. Box 1043, Wichita, Kan.

Feb. 25, 1930. St. Louis, Mo. Portland Cement Association regional safety meeting at Hotel Coronado, A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

Mar. 3-5, 1930. Chicago. National Management Congress, at Stevens Hotel. G. E. Pfisterer, manager, 308 W. Washington St., Chicago.

Mar. 3-7, 1930. Chicago. Industrial Equipment Exposition at Stevens Hotel. G. E. Pfisterer, manager, 308 W. Washington St., Chicago.

Mar. 3-7, 1930. Chicago. National Industrial Exposition at the Stevens Hotel. George Pfisterer, secretary, 308 W. Randolph St., Chicago.

March 4, 1930. La Salle, Ill. Portland Cement Association regional safety meeting, at Hotel Kaskaskia. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

Mar. 5-7, 1930. Chicago. National Industrial Equipment Exposition sponsored by the Society of Industrial Engineers, the American Society of Mechanical Engineers, the American Management Association, the National Association of Cost Accountants, and the National Association of Foremen, at the Stevens Hotel. G. E. Pfisterer, manager, 308 W. Washington St., Chicago.

Mar. 5-7, 1930. Chicago. Third National Materials Handling Meeting, American Society of Mechanical Engineers, at the Stevens Hotel.

March 18, 1930. Des Moines, Ia. Portland Cement Association regional safety meeting, at Hotel Fort Des Moines. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

March 19, 1930. Detroit. Regional meeting, American Society for Testing Materials, at Book-Cadillac Hotel. F. O. Clements, chairman, care General Motors Co., Detroit.

March 25, 1930. Kansas City, Mo. Portland Cement Association regional safety meeting, at Hotel Muehlebach. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

Apr. 5-9, 1930. New York, N. Y.; Hoboken, N. J.; Washington, D. C. Fiftieth anniversary meeting, American Society of Mechanical Engineers, at American Machinist offices in New York; Stevens Institute, Hoboken; U. S. Chamber of Commerce Bldg., Washington.

April 7-11, 1930. Atlanta, Ga. Annual meeting, American Chemical Society.

April 15, 1930. Albany, N. Y. Portland Cement Association regional safety meeting, at Hotel Ten Eyck. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

May 12, 1930. Cleveland, O. Meeting, Steel Founders' Society of America. G. P. Rogers, managing director, 932 Graybar Bldg., New York, N. Y.

May 29, 1930. Easton, Pa. Portland Cement Association regional safety meeting, at Hotel Easton. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

June 16-25, 1930. Berlin, Germany. World Power Conference. World Power Conference Program Committee, Room 818, 29 W. 39th St., New York, N. Y.

June 24, 1930. Cleveland, O. Portland Cement Association regional safety meeting, at Hotel Cleveland. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

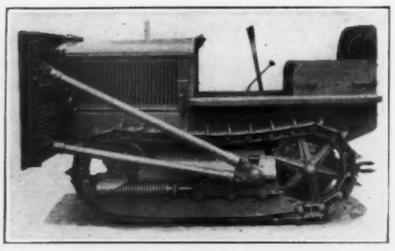
June 26, 1930. Washington, D. C. Portland Cement Association regional safety meeting, at Hotel Raleigh. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

July 1, 1930. Detroit, Mich. Portland Cement Association regional safety meeting, at Book-Cadillac Hotel. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

Sept. 9, 1930. Seattle, Wash. Portland Cement Association regional safety meeting, at New Washington Hotel. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

Sept. 16, 1930. San Francisco, Cal. Portland Cement Association regional safety meeting, at St. Francis Hotel. A. J. R. Curtis, secretary, 33 W. Grand Ave., Chicago, Ill.

NEW MACHINERY AND SUPPLIES



An improved push plate

Push Plate for Model Ten

The illustration shows the Push Plate or front bumper which has recently been made available for the Model Ten Tractor.

This Push Plate materially increases the adaptability of this small Model "Caterpillar," as it enables the tractor to push cars without being attached to them by chain or bar, as shown in the action picture. It will also find many additional places of applications.

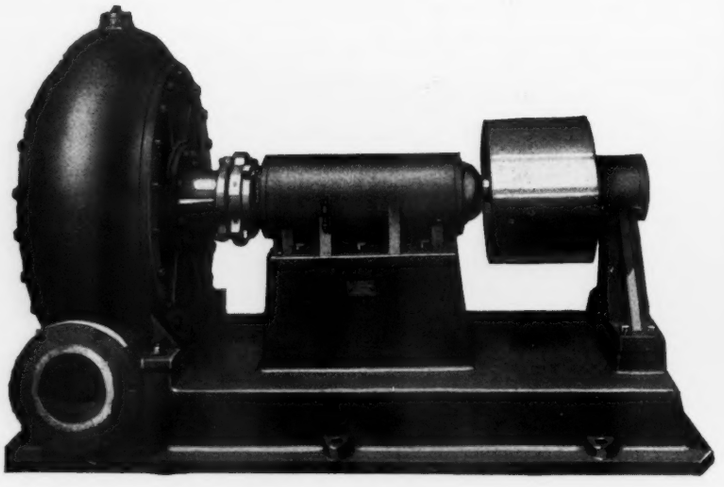
The front plate is 59¼ in. wide for 34⅝ in. deep, and the bottom edge of the push plate is approximately 16 in. from the floor when the tractor is equipped with standard tracks. The side members of the assembly come within the outer edge of the push plate unit is the same as the width of the push plate, namely 59¼ in. This push plate is manufactured by the Caterpillar Tractor Co. and sold through its dealers.

A New Full Revolving Gasoline Shovel

The Western Manufacturing Company, Detroit, Mich., has designed and is manufacturing a new full revolving gasoline shovel which is claimed to have exceptional power and speed, and is named the "Ace of Spades." Capable engineers have spent three years in developing this unit to meet the requirements of those interested in efficiently handling materials.

The hoist and swing mechanism is mounted on a center steel casting with massive center bearing which permits the easy removal of drum or clutch mechanism. The wide brake surface is composed of 187.5 sq. in. of Johns-Manville friction lining and clutch facing. The boom hoist is controlled by a hand level and chain-driven from the transmission, and operated through a worm gear. The dipper is built to withstand the toughest digging and is of ⅜-cu. yd. capacity with the 16-in. teeth, and top, which are made of Farral's No. 85 cast steel. The power plant is a 6-cylinder Hercules Model WXC gasoline engine, developing more than 50 hp. at 1,000 r.p.m. The 4-in. by 4½-in. cylinders are equipped with detachable L-type heads and force-feed lubrication. This engine supplies ample power for heaviest and most continuous service, plus the smooth operation of a 6-cylinder machine. It provides two speeds in either direction for operating crawler tracks or power boom hoist.

A full revolving gasoline shovel



A new dredge pump

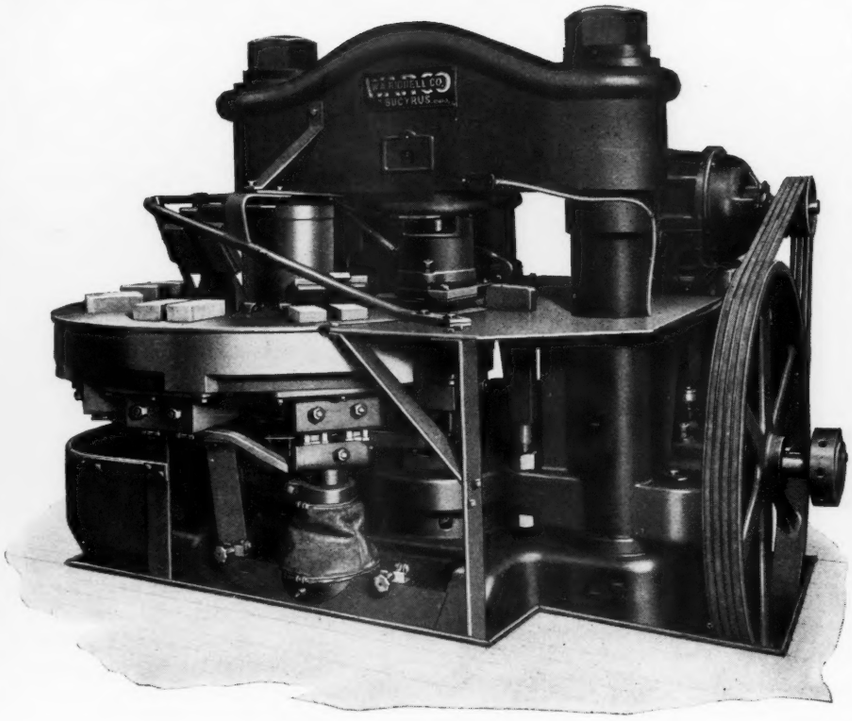
Fremont Company Brings Out New Dredging Pump

The Fremont Foundry and Machine Company of Fremont, Nebraska, is in the market with a new heavy-duty dredging pump. The company specializes in sand and gravel pumps, steel bins, pontoons, welded pipe, waste spouts, loading spouts, bin gates, rock catchers and similar equipment utilized in the dredging of sand and gravel.

The shell of this new pump is cast on a chill which gives a wearing surface so hard that it cannot be scratched with a file. Sand-blast and grinding-wheel tests compare favorably with those on manganese-steel shells. Side-plate openings in the shell are machined to fit accurately. The impeller is balanced carefully, machined, and centered truly, with a minimum clearance between it and the sides of the shell. The shaft runs in Timken roller bearings.

Improved Rotary Brick Press Announced

A new sixteen-mold rotary brick press, with unusual features, has just been announced by the W. A. Riddell Company. The new press has eight double molds, giving a rated capacity of 3,000 brick per hour. The machine is adapted for making pressed brick from semi-dry, granular or pulverized



A 16-mold rotary brick press

material. It is designed to operate under very heavy working pressure and the automatic relief device releases when the pressure reaches 225 tons.

The press consists essentially of heavy, reinforced base and frame castings; a revolving mold table which contains eight double, steel lined molds; suitable mechanism for driving and locking the mold table; an automatic feed hopper; a series of pressing levers; and the necessary gearing to operate the press. It is designed for operation by independent motor drive.

A feature of particular importance on the No. 980 press, which, when making standard size silica building brick, can exert a pressure of 7,500 lb. per sq. in. on each brick, is the special patented steel cover plates, which are attached to the revolving table and to which the upper pressure plates for each mold are attached. When a pair of molds have been filled by the automatic feeding hopper, cover plates drop over the molds and the upper pressure plates enter the mold. As the table revolves, the molds, with the cover plates over them, pass under the counter pressure plate and pressure is then applied from the bottom.

Pressure is applied from the bottom through a crank shaft and walking beam, and the same mechanism operates a vertical plunger lift-out which raises or ejects the pressed brick out of the mold at the same time the pressure is being applied to a mold under the pressure plate. When the bricks have been raised or ejected out of the mold, the lower pressure plates remain level with the top of the table until the machine has made three pressure operations.

Another feature of the press is the steel liners for the molds which are interlocking and reversible. They are constructed of laminated steel, having two hardened surfaces with a soft center. The liners are accurately fitted and are readily inserted or removed from the machine when required. They are so made that the wearing surfaces may be reground and reversed so as to greatly prolong the service life of the liners.

New Bodies Announced For 1930 Line

The new Anthony rotating power hoist body has been built to supply light truck users with a power body. The gear case used on this unit is one that has been built like a truck transmission to stand abuse. It was tested with 100 per cent overload, under continuous operation for 250 hours, at the rate of three dumps per minute. At 1,000 r.p.m. of motor, body dumps in four seconds. A large steel worm running into a large bronze gear makes up the inside of the case. A case hardened steel pinion turns a steel bull gear, which in turn pushes arm and raises body.

Automatic latch on front of body holds same in riding position, relieving strain on all gears and pinions. An automatic release throws power take-off out of gear when body is in full dumped and riding position.

This body is furnished in 1-yd. convertible to 2-yd. base and 1½-yd. convertible to 2-yd. base. It is possible to mount other special capacity and designed Anthony boxes on this understructure.

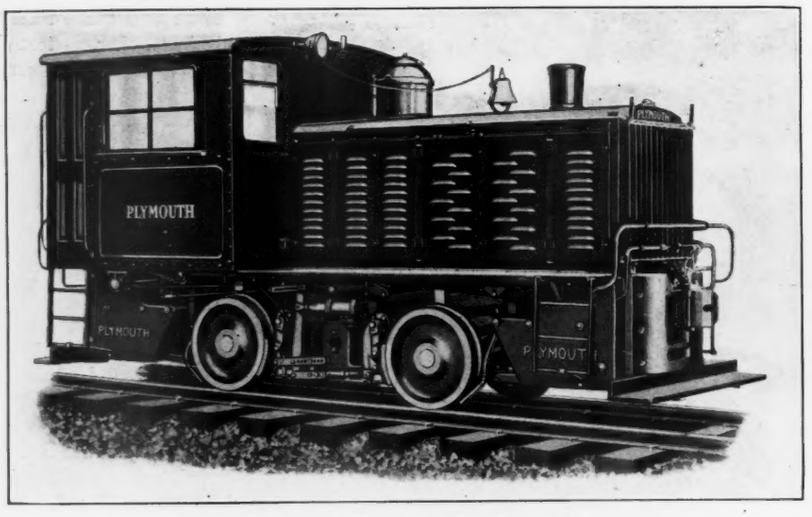
Anthony rotating fast hand hoist is almost automatic in action, requiring only 4½ turns of crank to put body in dumping position. Being a rotating unit, only 4½ turns in the same direction and body returns to riding position. The same type of construction is used in the rotating power lift. This unit is also equipped with latches to hold body at any angle for safety and convenience.

A general purpose body, designed to meet practically any kind of contracting and hauling conditions. The sides being removable will facilitate the speedy handling of such materials, that can be loaded from the side and stacked on the platform.

This body is made in standard 84-in. by 60-in. base with 18-in. head and tail. The new rotating power lift understructure is the standard lift used. The construction is of one piece steel, ten gauge, electrically welded.

All of the above bodies, as well as all other Anthony bodies, use heavy, built up steel rockers, on which load is carried and dumped. Eccentric double-acting tailgates are standard equipment.

Fast hand-operated dump body on a Ford truck



New gasoline locomotive enters field

New Plymouth Gasoline Locomotives

The Fate-Root-Heath Company has brought out a new line of Gasoline Locomotives known as Model "ML6" in three sizes—20, 25 and 30 tons, and Model "ML8" in two sizes—30 and 35 tons.

The Model ML6 is powered by a 6-cylinder Le Roi engine, while the ML8 is equipped with an 8-cylinder V type Le Roi engine. The latter makes an exceptionally powerful Locomotive where speed, as well as power, is an important factor.

The frame is a patented bar-steel type of special construction so as to use equalized semi-elliptic springs to the best advantage. This type of frame eliminates many parts that are ordinarily bolted to the frame, providing unequaled accessibility to all parts inside of frame.

The Springs are long and flexible, being 48 inches long and 4½ inches wide.

A new and special feature of this locomotive is that it is equipped with both side and cross equalizers, giving a true 3-point suspension so that the locomotive rides the roughest track with ease.

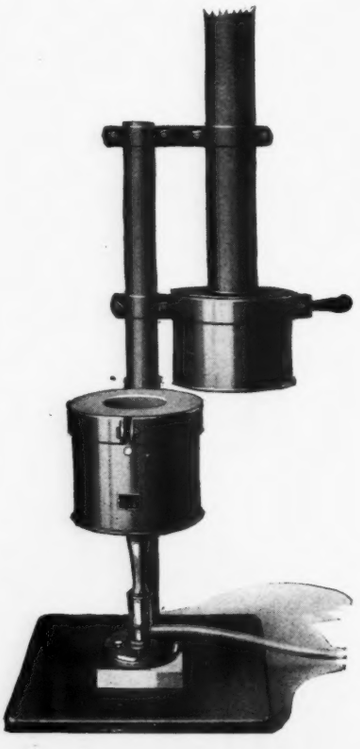
A new and improved clutch, that is removable without moving the engine or transmission, is used. The size has been increased to 16 inches in diameter, with 6 facings for the 6-cylinder and 8 faces for the 8-cylinder engine.

These models are now equipped with two large 12-volt starters, direct-driven air compressor and many other improvements giving greater efficiency and durability.

A New Laboratory Furnace

A new gas fired laboratory furnace said by the maker to possess several novel features and useful operating characteristics has been placed on the market by The Babcock & Wilcox Company. The furnace is fitted with an atmospheric burner which requires no auxiliary equipment, and can be left to burn unattended with safety. It will maintain a uniform temperature over long periods, and if fitted with the usual gas pressure regulator will maintain a temperature of plus or minus 10 deg. F. for several days.

It is claimed that this furnace can be brought up to working temperature very quickly. Tests conducted by the Industrial Research Division of Massachusetts Institute of Technology show the furnace to be capable of being brought from room temperature to 2500 deg. F. in about 30 minutes, and to 2000 deg. F. in approximately 15 minutes. The maximum temperature is somewhat over 2600 deg. F. using ordinary manufactured illuminating gas under the usual 3-in. (water gauge) pressure.



Laboratory furnace

The maker states that these unusual time-temperature operating characteristics are due to the use of proper gas velocities in the furnace, the stack proportions, a unique baffling arrangement, and the use of the new B. & W. 80 refractory insulator lining which has an extremely low heat conductivity. Either natural or manufactured gas may be used with the furnace, though the temperatures will be slightly lower with the former.

The furnace is compact, which feature combined with the insulating effect of the refractory lining makes it relatively cool and very convenient to work around. A device of this kind has many uses in the laboratory, many of which are apparent.

A Wide Radius, Broad Gauge Heavy Duty Derrick Crane

A new full circle, long boom, broad gauge crane and dragline is being offered by the American Hoist & Derrick Co. of St. Paul, Minnesota, for use in the general construction, excavating, and sand and gravel industries. This machine will be known as the American Revolver.

Its main features are a combination of the advantages of both derricks and locomotive cranes—the ability to handle heavy working and lifted loads at wide working radius; ease of movement by wheel mounting on track, or skid and rollers over rough ground; simplicity of its all steel construction; stability; and ready adaptation to all classes of heavy crane, derrick, or dragline work. Either steam, electric, diesel, or gasoline power may be used.

Mounting can be arranged to suit requirements. Can be mounted on eight double flanged wheels, wood skids, barge, pier, or gantry type. It is available in three sizes with booms 75, 85 or 100 ft. long and turnable diameters of either 14 or 20 ft. It is manufactured as a complete unit and offered as an addition to the standard line. Production of these machines will be carried on at both New York and St. Paul.

The services of Inscoe R. Bailey have been secured to aid in the design and field adaptation of the new American Revolver. Mr. Bailey was engaged for some time in the building and sale of similar equipment as a partner in the Dayton Whirley Co.